TECHNOLOGY DEPARTMENT

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Construction Methods

May 1928

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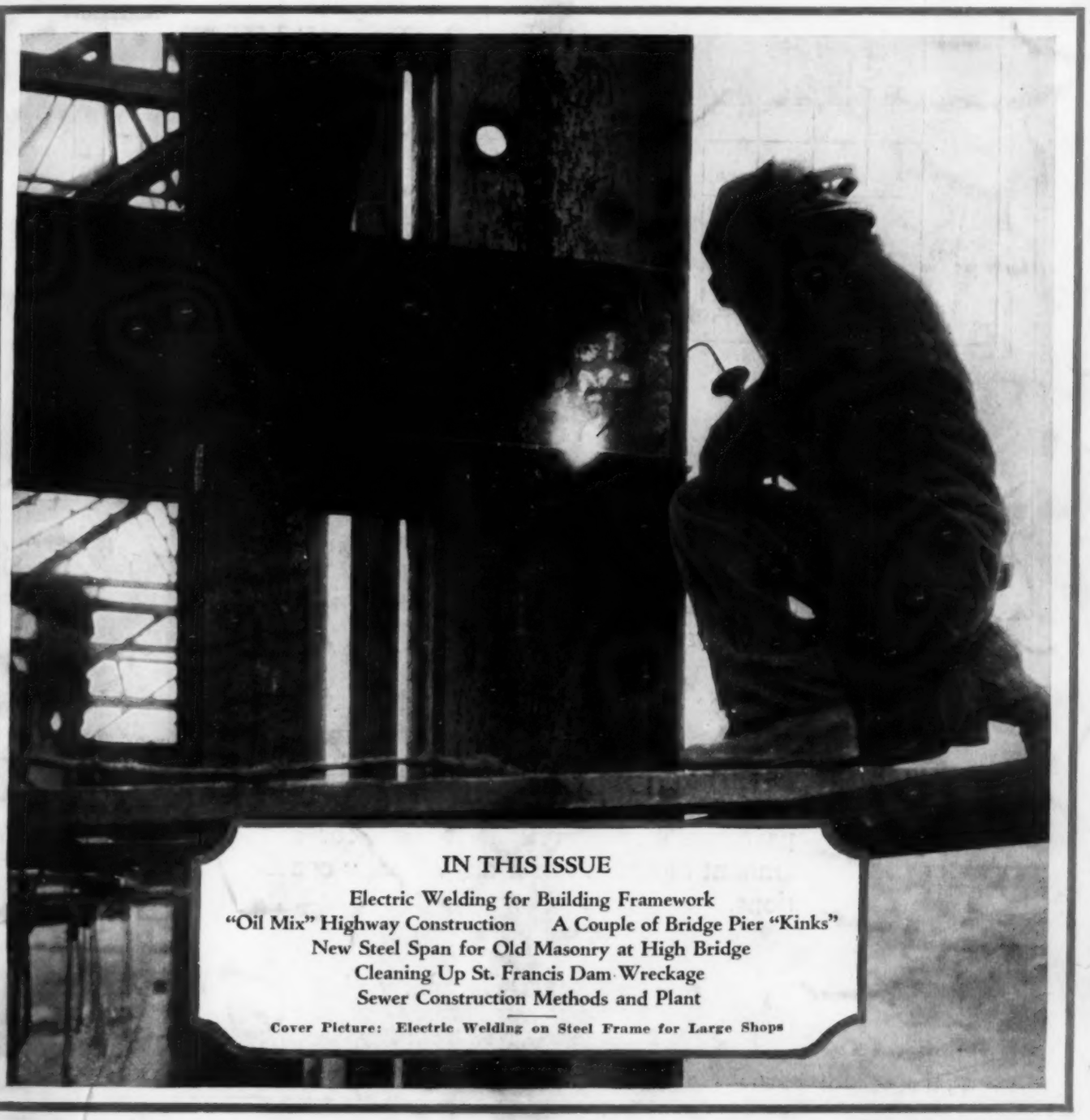

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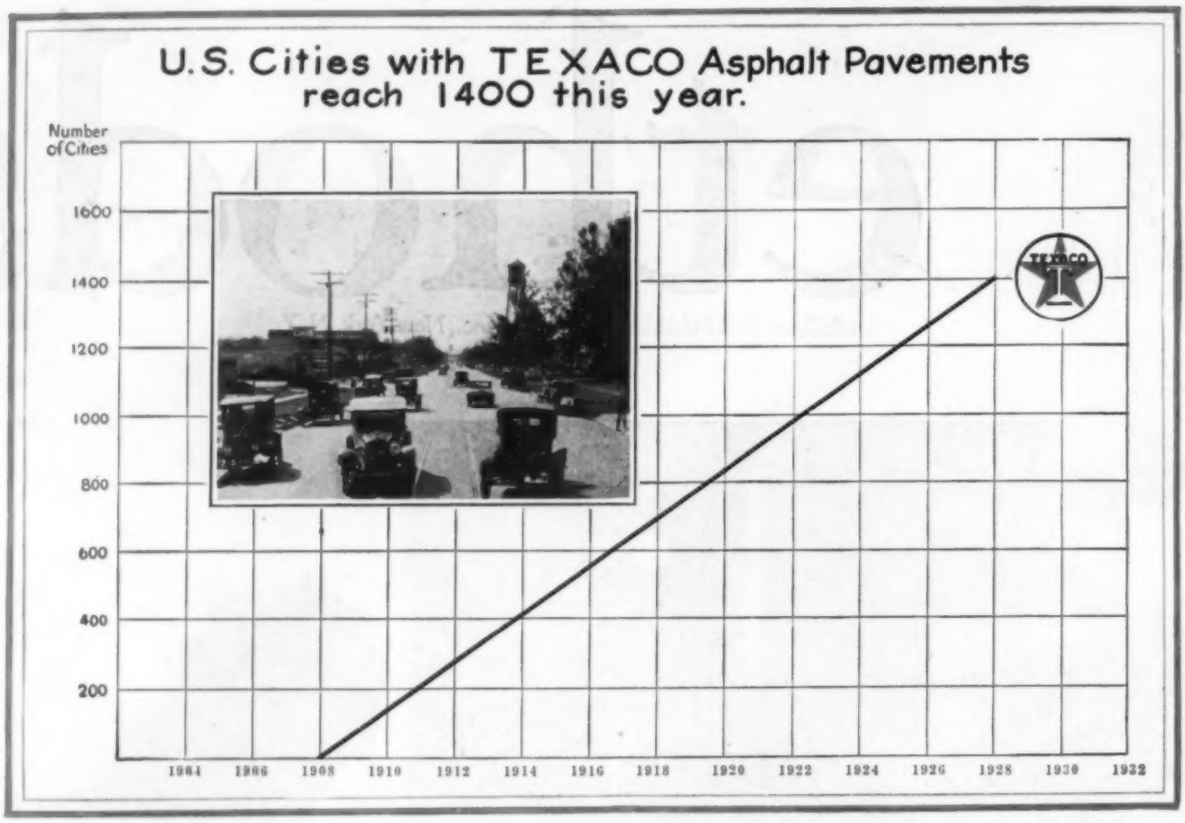
A MONTHLY PICTORIAL OF FIELD PRACTICE AND EQUIPMENT

General Construction • Highways • Buildings • Engineering • Industrial



Today, cities and towns having TEXACO Asphalt streets, total 1400

Within a span of about a quarter of a century, TEXACO Asphalt pavements have won country-wide acceptance. Today, 1400 cities and towns, representing the greatest and the smallest, have durable, resilient TEXACO Asphalt streets. Low in maintenance expense, waterproof and unaffected by changing temperatures, the TEXACO pavement has proved itself ideal for any amount of traffic under any climatic conditions.

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TECHNOLOGY DEPT.

What's Doing This Month

Looking it over with the Editors

CONSTRUCTION'S INFANTRY—In his vivid recital in the *Saturday Evening Post* of the story of "The Stars and Stripes," the newspaper of the American Expeditionary Forces in France during the war, Alexander Woolcott says:

"The 'Stars and Stripes' got out every issue on the assumption that, whereas others might run off with the glory, the doughboy, slogging along in the dirt and danger, would win the war. The soldiers who served the guns, toted the stretchers, mended the roads or even took the notes knew perfectly well, and knew all the time, that it was the infantrymen who were bearing the brunt of the battle. Now, in the soft clutter and confusion of life back home, I miss more than anything else—miss from my own thoughts, from the talk of my neighbors and from the publications I read—that lively sense of our common dependence on and our overwhelming debt to the men and women who have the infantry job in the battle of every-day existence."

Mr. Woolcott's observation is packed full of good, sound logic. It applies with particular force, we believe, to the infantrymen of the construction industry. Construction's doughboys are the men with field responsibility, whether they operate under the name of contractor, superintendent, resident engineer, general manager, foreman or company executive—the men who are out on the firing line, bearing the brunt of carrying on the present huge program of construction involving expenditures of $7,000,000,000 a year.

When the job is done and the citations are being handed out, let's have a few more *Croix de Guerre* pinned on

the field men of construction—the men who planned and planted the job and were responsible for turning blueprints into realities. It is for these men that *Construction Methods* is edited.

CONSTRUCTION METHODS

A monthly review of modern construction practice and equipment

PUBLISHED BY
McGRAW-HILL PUBLISHING COMPANY, INC.
TENTH AVENUE AT 36TH ST., NEW YORK

An Information Service to Help You

WITHIN the limits of the space available for pictorial articles in *Construction Methods* it is impossible to present full working data and machinery specifications for every job. Judging by the inquiries this journal receives, individual readers frequently desire information regarding plant layout, equipment or materials in more detail than can be given in the articles as published.

For example, you may want to know the boom length or lifting capacity of a locomotive crane, the line speed of a hoist, or the drum size of a concrete

mixer illustrated or described in a certain issue. In such cases, write to the Editor of *Construction Methods* (10th Ave. at 36th St., New York) and he will either supply the desired information or transmit your inquiry to the source from which it may be obtained.

CO-ORDINATION of operations on construction is one of the biggest factors in completing a job at a profit. That is why you will find the men responsible for planning and executing field work constantly on the alert to devise methods and select plant that will avoid any break in the train of handling materials on the job.

In the description of the Krenn & Dato Company's method of building a big sewer for Indianapolis, on p. 26, construction men will recognize the application of this principle of co-ordination in the use of a long belt conveyor to receive spoil from the trench excavator and deliver it as backfill over the completed pipe.

The layout is not new, but it has possibilities of wider use to eliminate the rehandling of material by allowing the three operations of excavation, pipe-laying and backfill, to proceed simultaneously. It's merely a matter of proper equipment and correct timing.

ELECTRIC WELDING is rapidly extending the scope of its application in the structural field. Last month saw the completion in West Philadelphia, Pa., of the steel frame for a large factory building fabricated in the shop and erected in the field by the electric arc welding process. A picture story on p. 6 of this issue tells how the job was done. The design, it is claimed, resulted in a saving of from 12 to 15 per cent in the tonnage of steel required, due to the use of simpler and lighter members, particularly in the roof trusses, and to the omission of gusset plates which are superfluous in the welding method of making structural connections. The structure is noteworthy as being the first one erected under the supervision of a city building department and foreshadows the need of a general revision of the requirements and restrictions of municipal building codes throughout the country.

In an allied field of structural steel work—bridges—another example of welding on a large scale is offered by a railroad bridge recently completed for the Boston & Maine Railroad at Chicopee Falls, Mass. A pictorial description of the methods and equipment used on this welded bridge job is scheduled for early publication in *Construction Methods*.

NEXT MONTH'S ISSUE will be a Water-Works Number, appearing at the time when the American Water-Works Association will be assembled in annual convention at San Francisco, June 11-15. In picture and text the June issue will carry a timely story to field men concerned with dams, reservoirs, pipe lines, trenches, steel tanks and the rest of the structures that come under the classification of "water-works construction."

A Simple Test

to Determine When to Use *High-Early-Strength* Universal Concrete

Does the owner want early use of the improvement?

Is extra-strong concrete desired?

Would early stripping and more frequent re-use of forms effect a substantial saving?

If so, use *High-Early-Strength* Universal Concrete.

This concrete may be made as workable as desired and used on *all types* of jobs. It not only is as strong at 3 *days* as ordinary concrete is at 28 *days* but is twice as strong at 28 days as ordinary concrete and better and stronger forever after (see diagram).

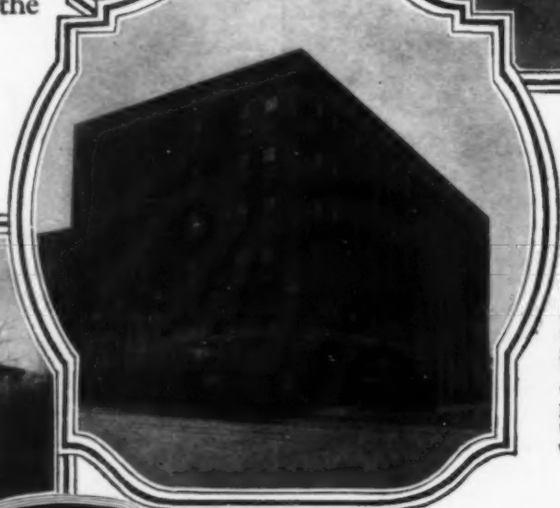
High-Early-Strength Universal Concrete is made by approved methods with *usual* materials, *usual* equipment, *usual* labor and *usual* Universal cement. For full details send in the accompanying coupon.

Universal Portland Cement Co.

Chicago Pittsburgh Minneapolis Duluth Cleveland Columbus New York

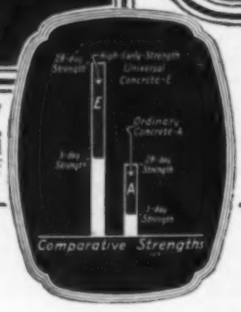
Concrete for Permanence

The Lehon Co., Chicago, needed a new shipping platform. The builder completed the job in 3 days without interruption to loading by using *High-Early-Strength* Universal Concrete.



The 150-ton sand and gravel bin of the Monongahela, Pa., Coal & Supply Co. was closed down awaiting completion of a new driveway. By using *High-Early-Strength* Universal Concrete the company secured use of driveway in 3 days.

Periodic rises of the Vermilion River made it necessary to increase the height of the bridge of the Streator, Ill., Drain Tile Co. Both early use of the improvement and permanently stronger concrete resulted from use of *High-Early-Strength* Universal Concrete.



The roof slab of the Ward Hotel, Aberdeen, S. D., reached the concreting stage when winter set in. With speed essential to meet scheduled completion date, the contractor used *High-Early-Strength* Universal Concrete, shortening the period during which protection from freezing was necessary. The building was then housed in with tarpaulin and work rushed on the lower floors.

Universal Portland Cement Co.
208 South La Salle Street, Chicago

Without obligation, please send me detailed information on methods of securing strong concrete in 3 *days* with the usual materials and equipment.

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C.M. 5-28

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Construction Methods

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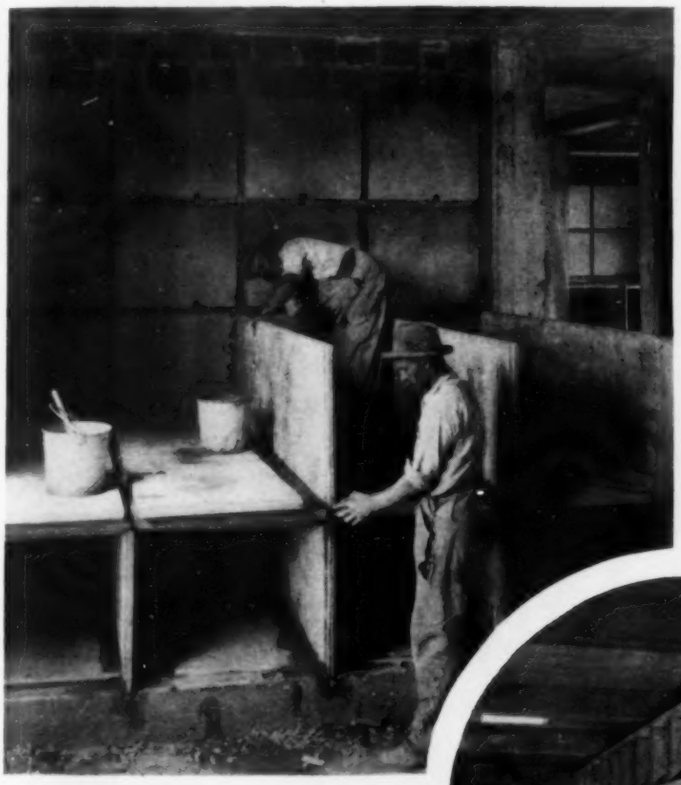
A monthly pictorial of field practice and equipment illustrating successful construction, maintenance and material-handling methods for general construction, highways, buildings, industrial plants and public works and utilities

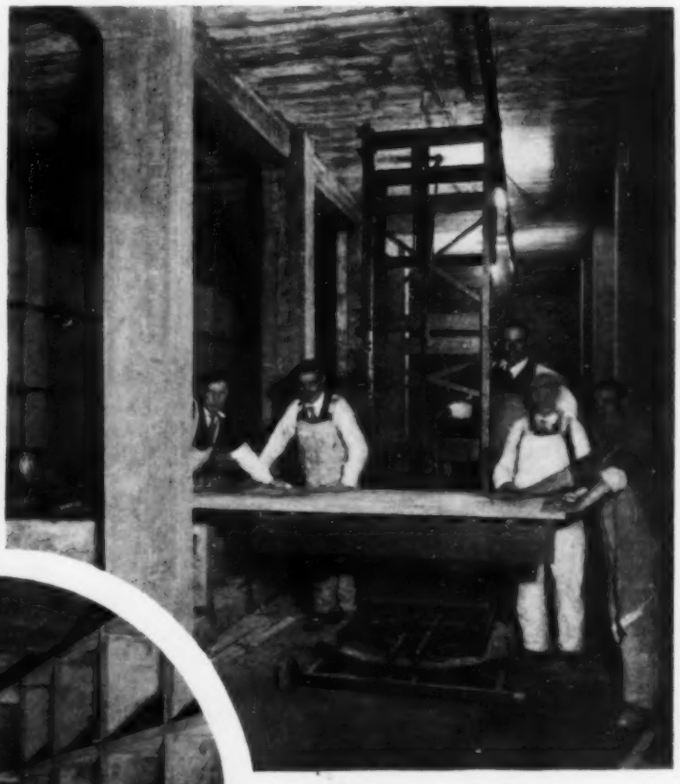
WILLARD CHEVALIER
General Manager
ROBERT K. TOMLIN
Editor

VOLUME 10 | NEW YORK, MAY, 1928 | NUMBER 5

Roofing Slabs Used to Build Crypts



CEMENTING the joints of the flat tile slabs forming the walls of the 3,800 crypt units.

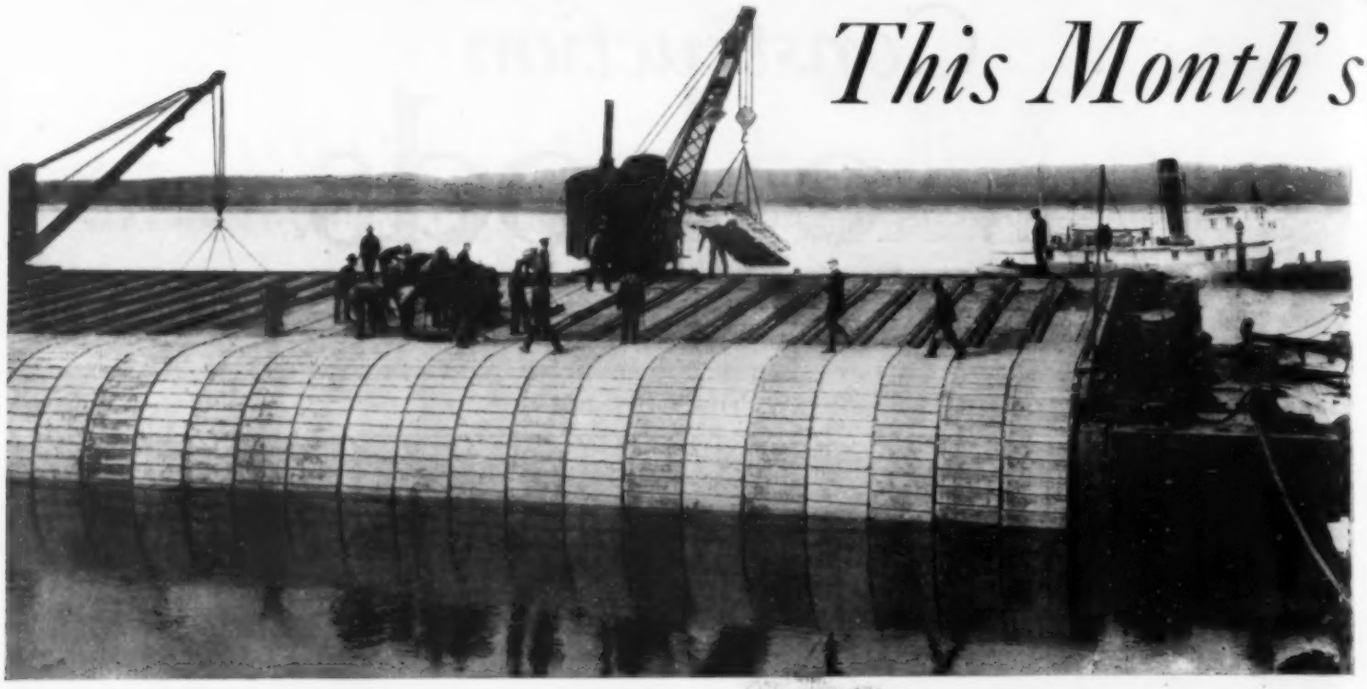


A TIER-LIFT TRUCK with roller-equipped platform delivered the slabs to place.

THE COMPLETED cement-tile crypts were built in rows of four tiers.

FLAT cement tile slabs of the general type commonly used in roof construction are finding a new application in the building of crypts for cemeteries. How the Presbrey-Leland Company of New York and Salmond Scrimshaw & Company of Arlington, N. J., employed this method of vault construction for the Fairmount Cemetery Mausoleum at Newark, N. J., is shown in the accompanying photographs. A mobile tier-lift truck with platform equipped with rollers delivered the pre-cast slabs and aided in placing them. The slabs, 7 ft. 8 in. long, 2 ft. 10 in. wide and 2 in. thick reinforced with welded galvanized wire mesh, were supplied by the American Cement Tile Mfg. Co., of Pittsburgh. Field operations were simple, involving merely the cementing of the joints after the slabs had been set in place. On this contract a total of 3,800 crypts were constructed by the methods shown. It will be noted that the design of the crypts provides for a grooved joint into which the slab edges fit tightly. General plans for the Fairmount Mausoleum were prepared by William Henry Deacy, architect, of New York City.

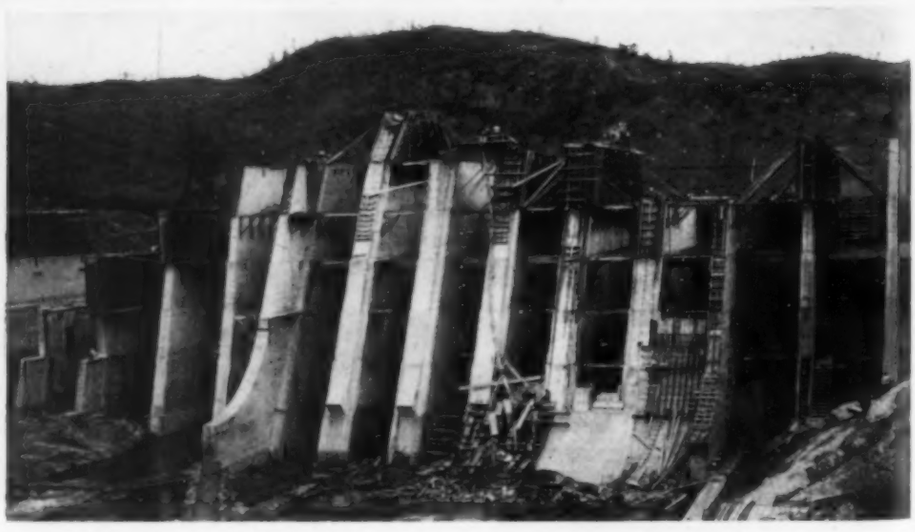
This Month's



A CONCRETE STRAIGHTJACKET to restrain the unruly Mississippi River from scouring its channel banks. This mat-laying rig is equipped with a pair of traveling cranes that transfer pre-cast concrete mat slabs from barges to roller-bearing skids. As the barge pulls away from the shore the mat sinks to place.

© *Wide World Photos*

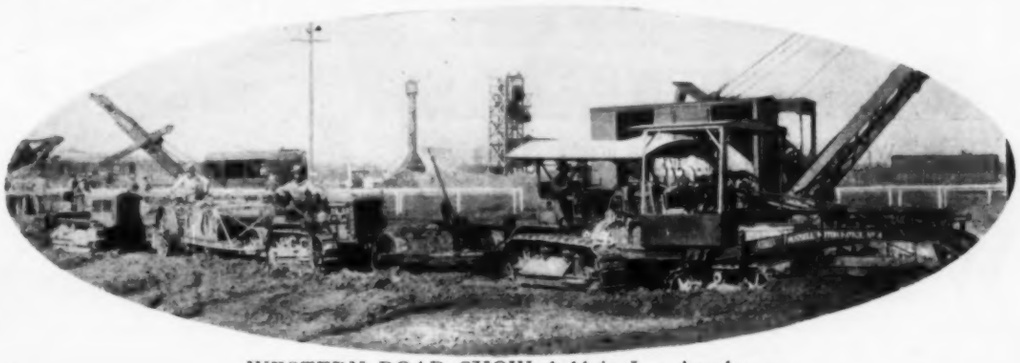
NO COLLISIONS at these highway crossings. How Chicago is handling the grade separation problem on the Irving Park Boulevard.



STONY GORGE DAM, a feature of the Orland project in California, is rapidly taking shape under the direction of the U. S. Bureau of Reclamation.

"News Reel"

NEW TOLL BRIDGE entrance to New Orleans is provided by a 4.72 mile concrete trestle across Lake Pontchartrain, recently completed by the Raymond Concrete Pile Co.



WESTERN ROAD SHOW, held in Los Angeles recently, offered manufacturers some of those great open spaces for putting their equipment through its paces.

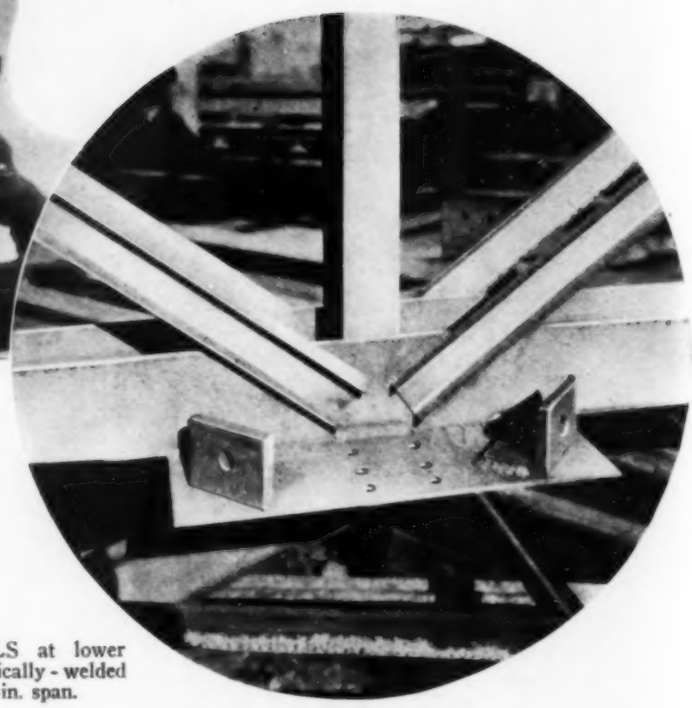
CLEVELAND'S LATEST in skyscraper construction. New Terminal Tower Building erected by John Gill & Sons, general contractors, under the supervision of H. D. Jouett, chief engineer.

BUILDING PHARAOHS TO ORDER for the Shrine Convention at Miami, Fla. John B. Orr Construction Co. constructs huge plaster statues 16-ft. high which the W. A. Dickinson Transfer Co. delivers to the Avenue of the Gods.

Electric-Arc

Used to Fabricate and Large Industrial

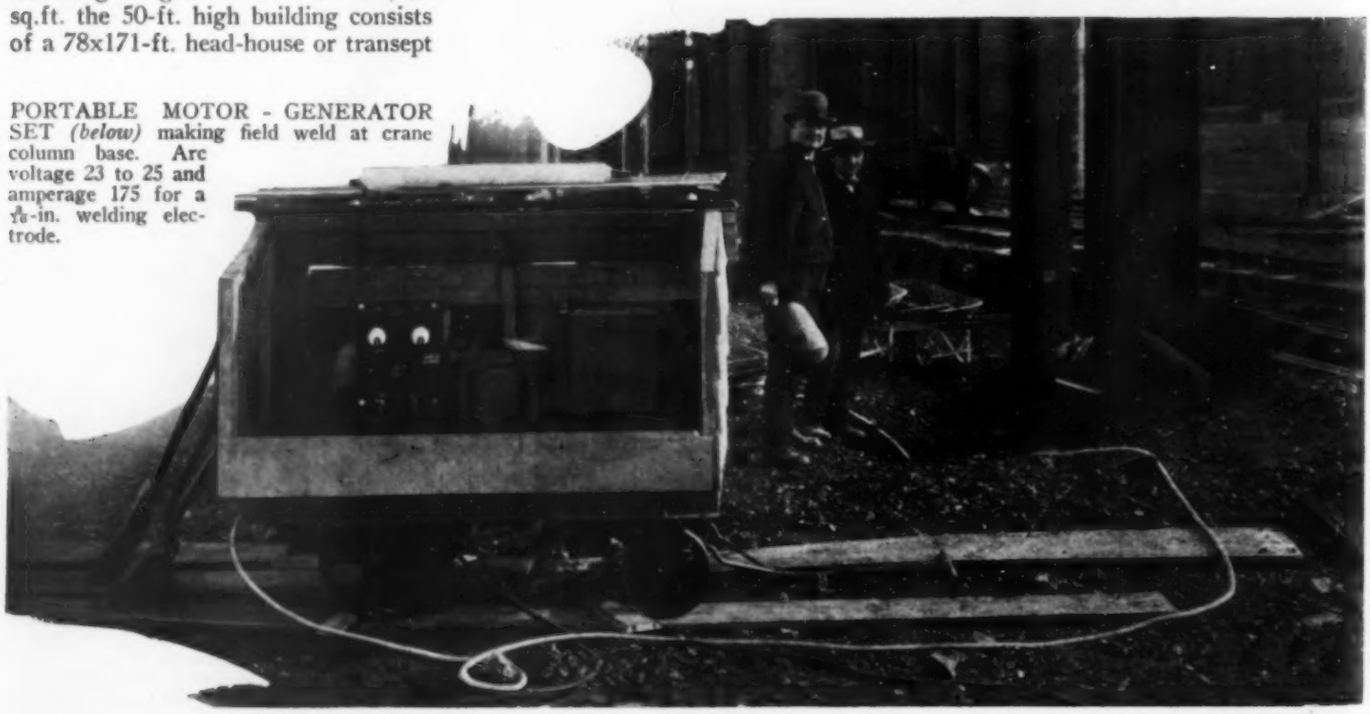
WELDER at work on crane bracket connection to column.



JOINT DETAILS at lower chord of electrically-welded truss with 58-ft. 6-in. span.

WITH both shop and field connections of its steel members made by electric arc welding instead of riveting, the new tank shop building at the West Philadelphia Works of the General Electric Co., is the first large all-welded steel framework to be erected under the supervision of a city building department. Covering a ground area of 80,150 sq.ft. the 50-ft. high building consists of a 78x171-ft. head-house or transept

PORTABLE MOTOR-GENERATOR SET *(below)* making field weld at crane column base. Arc voltage 23 to 25 and amperage 175 for a $\frac{1}{4}$-in. welding electrode.



Welding

Erect Steel Frame for Building

COMPLETED STEEL FRAMEWORK for the General Electric Company's large tank shop at West Philadelphia, fabricated and erected by electric-arc welding process.

STEEL ANGLE, welded to column, provides simple connection for anchor bolt.

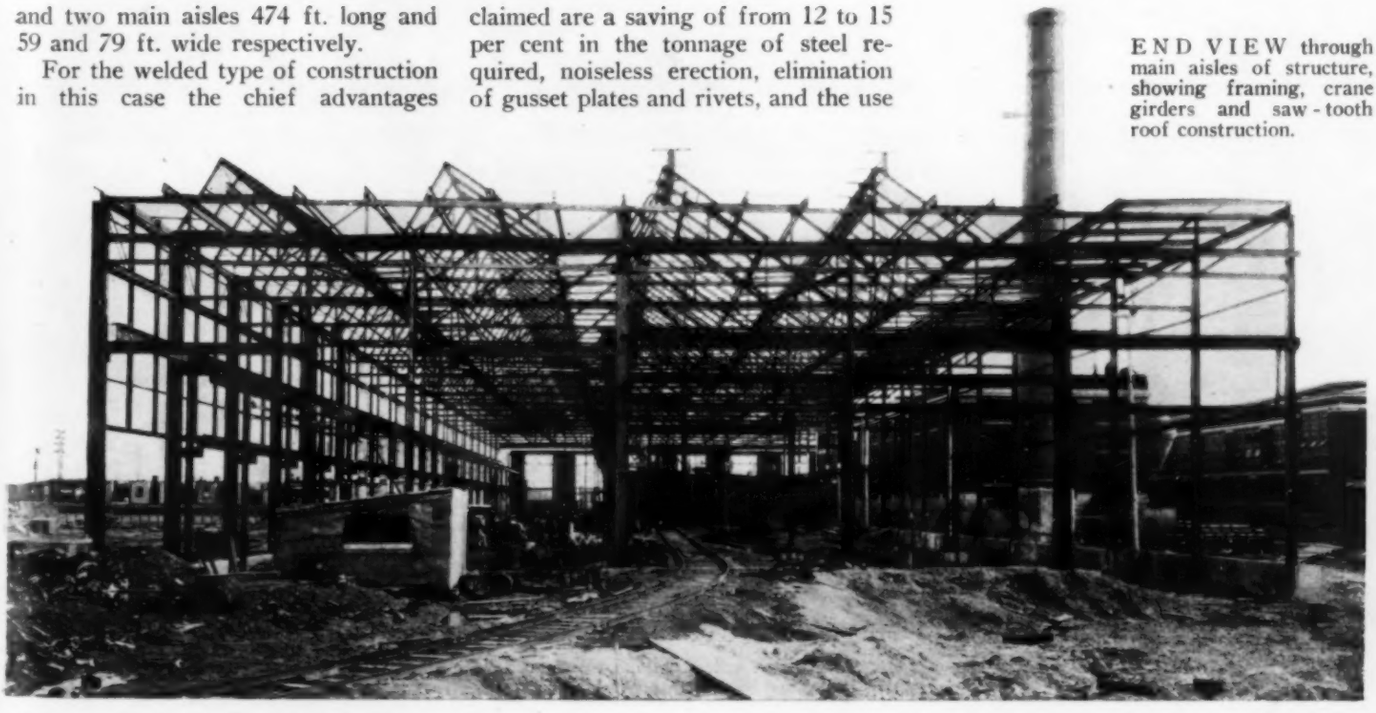
and two main aisles 474 ft. long and 59 and 79 ft. wide respectively.

For the welded type of construction in this case the chief advantages claimed are a saving of from 12 to 15 per cent in the tonnage of steel required, noiseless erection, elimination of gusset plates and rivets, and the use of simpler members than would be necessary for riveted construction.

Design — The building framework consists of steel columns of new Carnegie beam types supporting transverse Pratt trusses of electrically welded members, with depths of from 8 ft. 4 in. to 7 ft. and spans from 78 to 58½ ft.

The bays in the main aisles of the building are 24 to 25 ft. and in the headhouse from 25 ft. 7 in. to 29 ft. 3 in.

Roof Trusses—The roof truss de-



END VIEW through main aisles of structure, showing framing, crane girders and saw-tooth roof construction.

sign calls for one 8-in. Carnegie beam (with flanges vertical) for each top and bottom chord. To the outer surfaces of the flanges are welded channel diagonals, and to the inner surfaces 7-in. I-beam verticals. This design avoided the use of 1,200 gusset plates in the trusses and eliminated lattice bars except in the case of two members. Provision is made for carrying both 10-ton and 5-ton cranes on Carnegie beams supported by auxiliary crane columns.

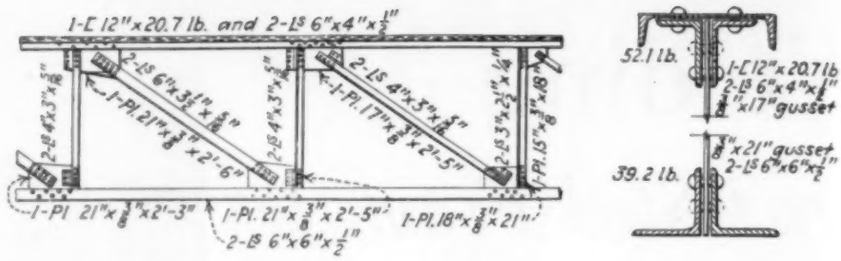
Horizontal bracing of diagonal rods with Carnegie beam struts is provided in the plane of the lower truss chords. Vertical longitudinal bracing is used in several bays to resist crane stresses.

Welding Process—In the electric-arc welding process one electrode is a metallic rod, guided by the operator, and the other electrode is the junction point of the two surfaces to be connected. As the current makes its circuit, producing intense heat at the arc, the metallic rod melts away and deposits a fillet between the two surfaces to be connected, thus fusing and welding them together.

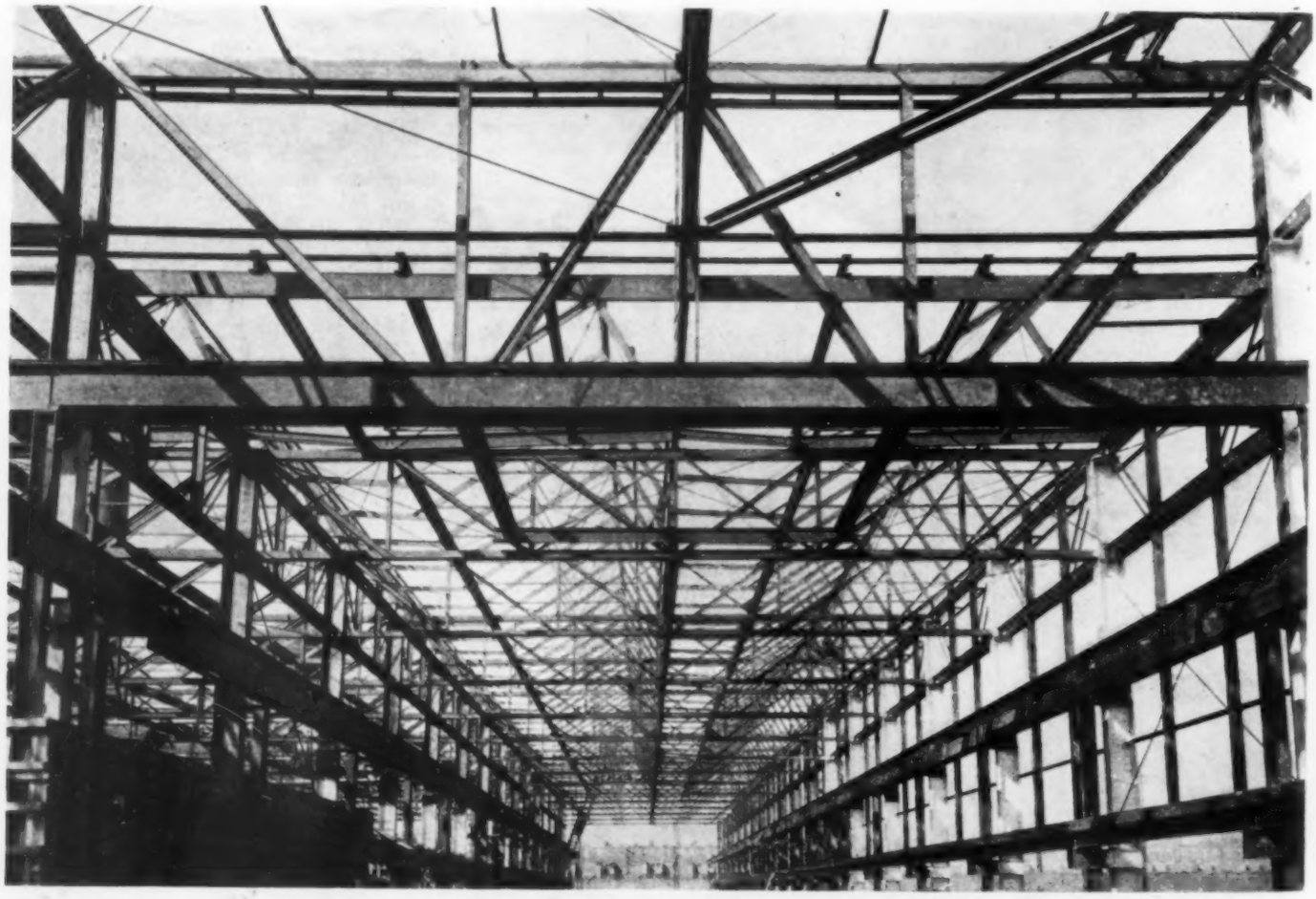
The structure at West Philadelphia required a total of 989 tons of structural steel, of which 745 tons passed through the welding shop of the American Bridge Company at Trenton, N. J., where most of the roof trusses were fabricated. At the fabricating shop five welding units and at the building site two welding units were used. As made by the General Electric Company, these motor-generator welding sets comprise electric generator, control panel, motor, starter and reactor, all assembled on a base.

For the building framework most of the welds were made with $\frac{3}{8}$x$\frac{3}{8}$-in. triangular fillets. The arc voltage was 23 to 25 and the amperage 175 for a $\frac{5}{16}$-in. welding electrode. Direct current was used. All lengths of welds specified in the plans were marked on the assembled steel. The unit shearing stress used in the design for the $\frac{1}{8}$-in. fillet welds was 3,000 lb. per linear inch, a figure which tests showed to represent a factor of safety of at least four.

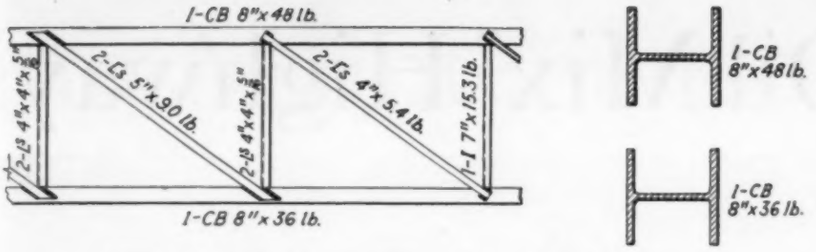
Shop Fabrication — In the Trenton shops the large roof trusses were put together by first laying the bottom chord against a long 8x8-in. angle welded to I-beam skids. Then the top chord was spaced and clamped to the skids. Finally the verticals and diagonals were clamped to the chords and the joints welded. All trusses were assembled and welded lying flat on the skids.



FOR A RIVETED ROOF-TRUSS it would have been necessary to use a design similar to the one above.



LOOKING ALONG one of the main aisles of the welded steel structure, showing crane girders carried by separate column supports.



WELDED CONNECTIONS actually used in the structure greatly simplified the roof truss design and decreased its weight.

Coming—

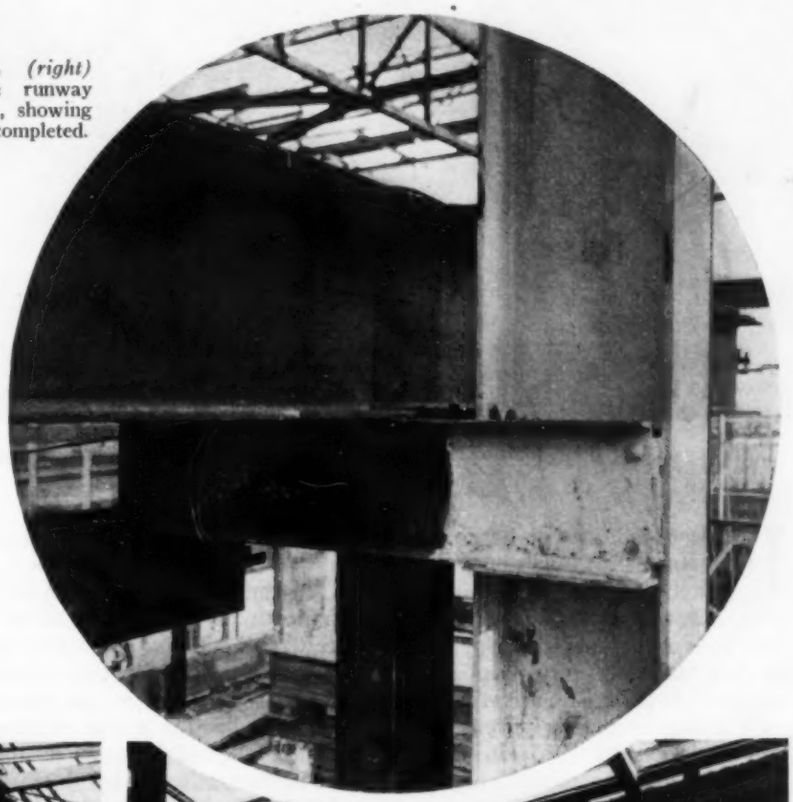
A WELDED BRIDGE

In the field of steel fabrication and erection two types of structure predominate—buildings and bridges. This month's story on an electrically welded building will be followed in an early number by a pictorial article on an electrically welded railroad bridge for the Boston & Maine Railroad at Chicopee Falls, Mass.

The operations of shop fabrication and field erection each required two months. Before any welder was allowed to work on this building, either in shop or field, he was given tests and his work subsequently was watched by an inspector.

For the General Electric Company, William Dalton of that organization's engineering department has general supervision of the West Philadelphia shop building. The general contractor is the U. G. I. Contracting Company of Philadelphia, with R. E. Glasheen on the job as erecting engineer. The steel work was fabricated and erected by the American Bridge Company, J. H. Edwards, chief engineer, and P. H. Greiner, resident engineer.

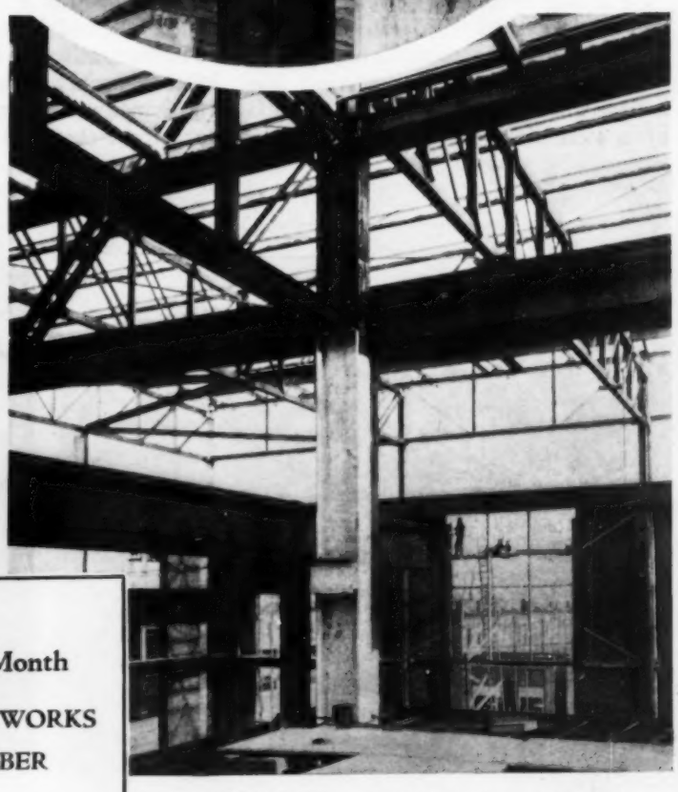
DETAIL *(right)* of crane runway bracket, showing welding completed.



FORMS in place ready for pouring concrete around structural steel members.

Next Month

WATER-WORKS NUMBER



FRAMING at the intersection of the main building with the transept.

"Oil Mix" Highways

APPLYING THE FUEL OIL to the scarified highway surface with a pressure distributor.

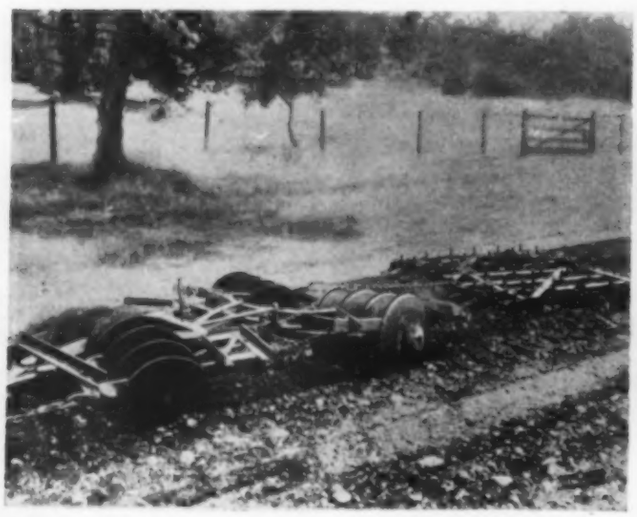
FOR conditions where surface treatment of highways by the penetration method is unsatisfactory, due to lack of good cementing base rock or suitable local clay or other binding material, California has developed and is using extensively on roads with gravel or crushed stone tops the "oil-mix" method which, it is claimed, produces a surface requiring practically no patching and involving low maintenance costs. The oil-mix method of construction, as outlined by T. E. Stanton, assistant state highway engineer, is as follows:

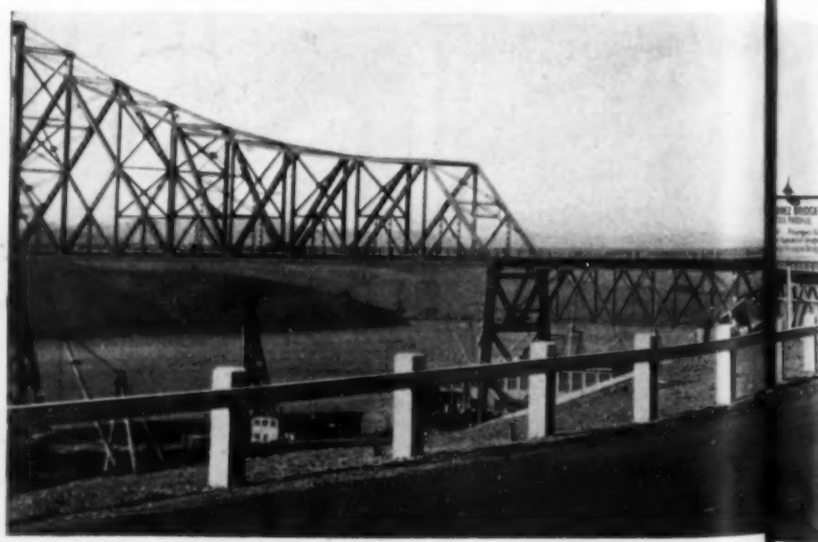
After the road has been scarified to a depth of 2 to 3 in., 60 to 70 per cent fuel oil is applied by a pressure distributor in two or three applications, each of ½ gal. per square yard. After each application a disc harrow, sometimes followed by a spring tooth harrow, thoroughly mixes the oil with the loose material of the scarified road surface, making several trips back and forth over the oiled section.

The second and third fuel oil applications are disc harrowed in the same way.

The material is then thoroughly remixed by a number of passages of a blade grader which casts the material into windrows and then flattens them out. The process of blade mixing is continued until the stone or gravel surfacing is thoroughly coated with oil and until the entire mixture has attained a uniform brown color. During the process of mixing, the material,

MIXING IS DONE by a disc harrow, sometimes followed by a spring tooth harrow.





THE FINISHED ROAD will serve a large volume of traffic for a number of years at a much lower maintenance cost than the expense of maintaining and

Cut Maintenance Costs

PREPARATION OF THE SURFACE involves scarifying to a depth of from 2 to 3 in.

according to Mr. Stanton, is sometimes turned over from 30 to 40 times.

On the grader a properly curved mold-board set at approximately a 45-deg. angle and operated at a relatively high speed is essential for proper mixing. The operating speed for the tractor-hauled graders is 4 miles per hour, in order to produce a rolling action on the material instead of a sliding or crowding action. After thorough mixing the surface is graded to a uniform cross-section by a finish grader and maintained smooth under traffic by a light grader for several days. The final grading should shape only the top inch of the surface.

It is essential that an experienced and expert operator be used for the finish mixing and spreading. If not properly handled, the mixed material may be spread too thin in places and unnecessarily thick in others, particularly on super-elevated curves. Insufficient thickness results in early raveling. In case raveling does occur the usual method of repair is to paint the surface of the hole lightly with fuel oil and then fill the cavity with premixed $\frac{3}{4}$-in. stone and oil, tamped or rolled into place.

The oil mix method is said to produce a layer of mineral aggregate and bitumen closely akin to asphaltic concrete.

NEXT MONTH

An outstanding job of fabricating and laying steel pipe for additional water supply at Springfield, Mass.

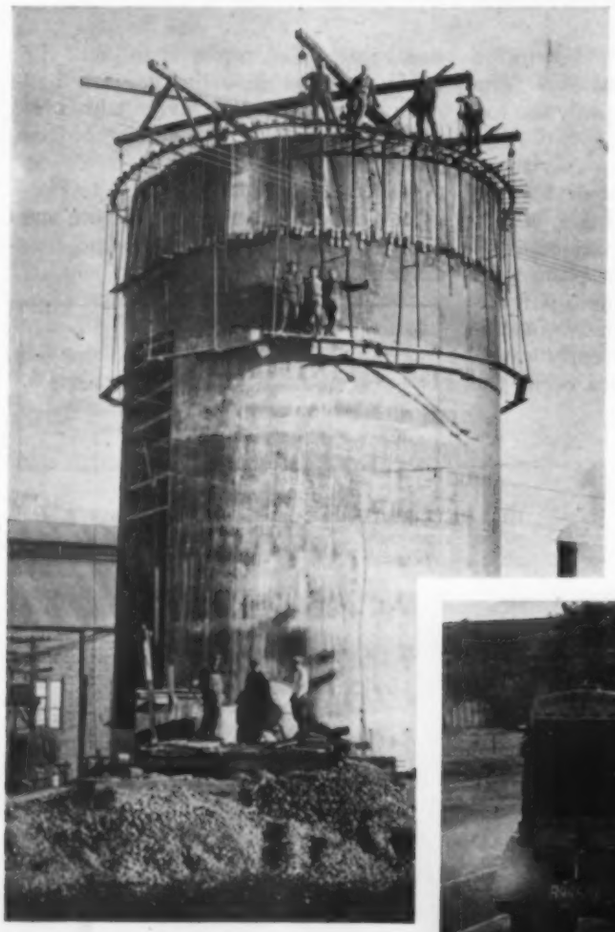
renewing a rock road with an untreated surface. Care and skill are necessary if satisfactory results are to be secured.

BLADE GRADERS making a number of passages over the oiled section complete the mixing process.

Getting Down to DETAILS

Close-up Shots of Job Methods and Equipment

DUAL HOOK-UP of tractor-hauled road grader and Wisconsin type drag on maintenance of National Forest highways in Colorado.



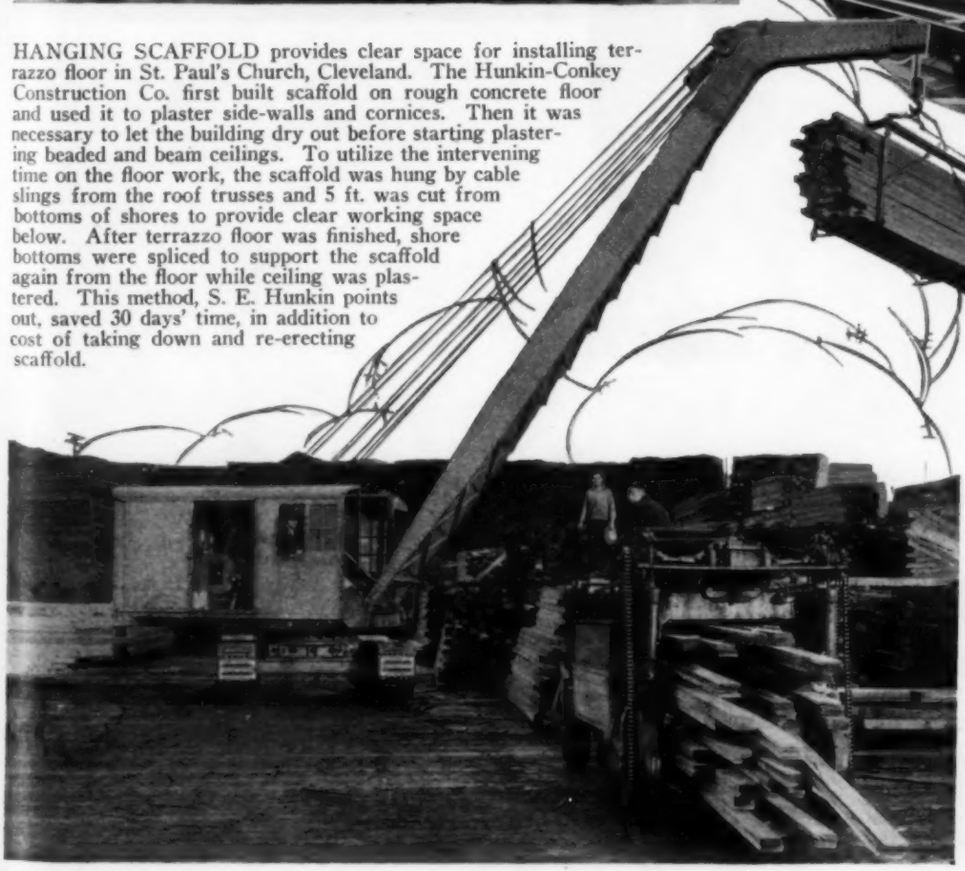
ADJUSTABLE SLIDING FORMS (*left*) used by the Rust Engineering Co., of Pittsburgh, to build a reinforced concrete chimney 409 ft. high and 21 ft. inside diameter at the top, for the Consolidated Mining & Smelting Co., at Trail, B. C. Steel forms shown in picture have been raised into position for next pour and are about to be lined up before placing concrete.

PORTABLE AIR HOIST *(right)*, on an Ingersoll-Rand compressor, speeds trench backfill with slip scraper for Melrose & Malden (Mass.) Gas Co. The outfit also supplies air for the pneumatic rammers.

A REMOVABLE SURFACE for concrete pavements is now obtainable by newly developed and patented "sheet concrete" method. By interposing a layer of cotton fabric between base and top courses a lateral splitting or cleavage plane is formed, allowing surface to be removed and renewed, if necessary, without destroying base. The method also permits more cement to be used in top and less in base, with full adhesion between courses, as cement mortar penetrates through fabric layer which separates aggregates in base and top. Photo shows Westchester County (N. Y.) parkway road built by John Aborio, contractor, of New Haven, Conn., under specifications of the Sheet Concrete Pavement Corporation, of New York.

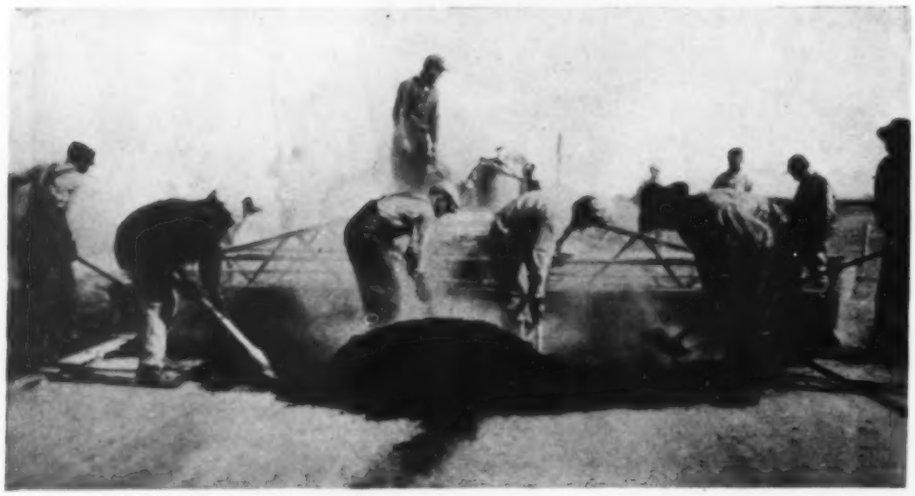
HANGING SCAFFOLD provides clear space for installing terrazzo floor in St. Paul's Church, Cleveland. The Hunkin-Conkey Construction Co. first built scaffold on rough concrete floor and used it to plaster side-walls and cornices. Then it was necessary to let the building dry out before starting plastering beaded and beam ceilings. To utilize the intervening time on the floor work, the scaffold was hung by cable slings from the roof trusses and 5 ft. was cut from bottoms of shores to provide clear working space below. After terrazzo floor was finished, shore bottoms were spliced to support the scaffold again from the floor while ceiling was plastered. This method, S. E. Hunkin points out, saved 30 days' time, in addition to cost of taking down and re-erecting scaffold.

FRAME for tying reinforcing bars at joints for concrete canal lining simplifies operations for field men on Yakima project of U. S. Bureau of Reclamation in Washington. Picture shows main canal of Kittitas division.



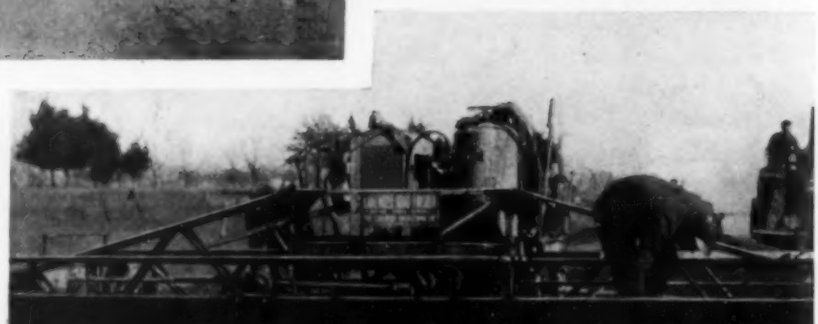
SPECIAL BOOM on Northwest crane, with the help of a Ross carrier, speeds lumber handling at the yards of the Inman-Paulsen Lumber Co., Portland, Ore. This equipment, according to the Pacific Hoist & Derrick Co., of Seattle, carries a 5-ton load and spots it at the proper point of discharge.

Machine Spreading *for* Asphalt Surface



UNSKILLED LABOR (*left*) spreads the hot asphalt surface mix, and the machine distributes the material accurately and rapidly before it cools.

THE MATERIAL (*below*) is kept banked against the screed of the finishing machine for its entire length. Rate of progress is 7½ lin.ft. per minute.



THE H. L. Cannady Company, highway contractor, of Tulsa, Okla., reports a substantial saving in labor by applying to the spreading of hot asphalt mix for paving surface the same finishing machine that was used to screed and tamp the concrete pavement base. The equipment was a standard Lakewood outfit operated in the regular way except that on the asphalt work the tamping feature was omitted, the screed member alone being used to spread, compress and surface the top course.

THE ROLLER (*left*) follows along while the asphalt is still hot.

ON WIDENED CURVES (*below*) one wheel travels a wood rail, the other the outside curb. The small extra width is then easily spread and raked by hand behind the finisher.

This method of machine spreading and finishing for asphalt eliminated the need for expert hand rakers, reduced the number of minutes required for spreading and speeded up progress.

The machine travels on the concrete curb, no other side forms being required. The heat of the material keeps the steel screed member hot enough to prevent sticking when the machine is operating. In the morning, before starting work, the screed is given a preliminary heating with a kerosene torch, as the temperature has averaged 34 deg. Fahr.

Present and Accounted For —

A Page of Personalities From the Field of Engineering and Construction

Leaves A.G.C. to Head Construction Company

BRIG.-GEN. R. C. MARSHALL, JR., has resigned as general manager of the Associated General Contractors of America, effective May 1, to become president of the Sumner Sollitt Company, general contractor of Chicago. His service with the A.G.C. covered a period of 8 years. During the World War General Marshall, as chief of the Construction Division of the Army, was in charge of the $8,000,000,000 emergency building program in the United States, involving cantonments munitions plants, warehouses and shipping bases.

A.R.B.A.'s New President

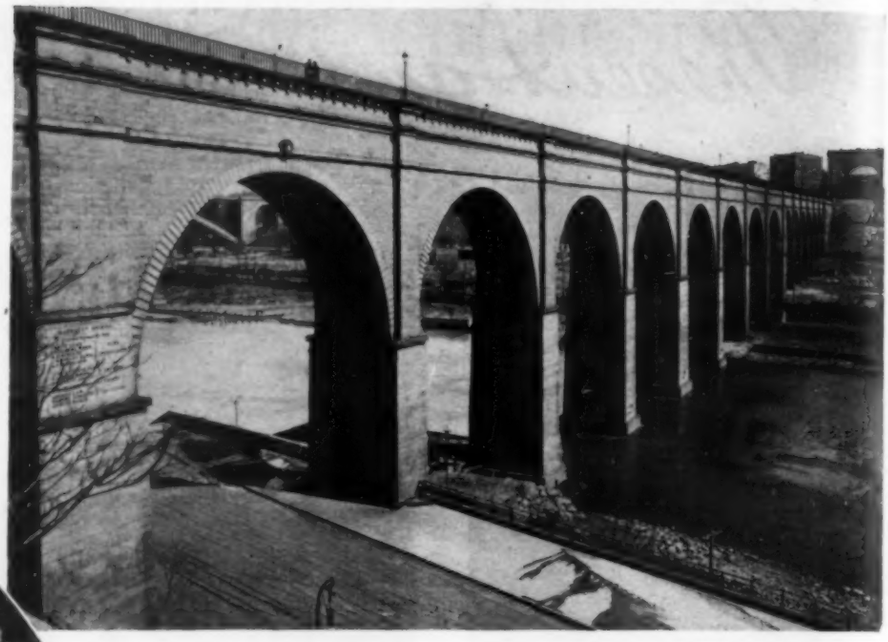
COL. R. KEITH COMPTON, director of the Department of Public Works of Richmond, Va., takes office as president of the American Road Builders' Association at that organization's annual meeting in Washington, D. C., May 11, succeeding Charles M. Babcock, chairman of the Minnesota Highway Commission.

To Manage the Associated General Contractors

DANIEL A. GARBER, the successor to Brig.-Gen. R. C. Marshall, Jr., as general manager of the Associated General Contractors of America, effective May 1, was one of the original organizers of the A.G.C., and its first president. In assuming his new post with headquarters at Washington, D. C., Mr. Garber relinquishes the presidency of the North-Eastern Construction Company of New York. In addition to his activities in the construction field, Mr. Garber has served several terms as mayor of Ridgewood, N. J. and as a member of the North Jersey Transit Commission.

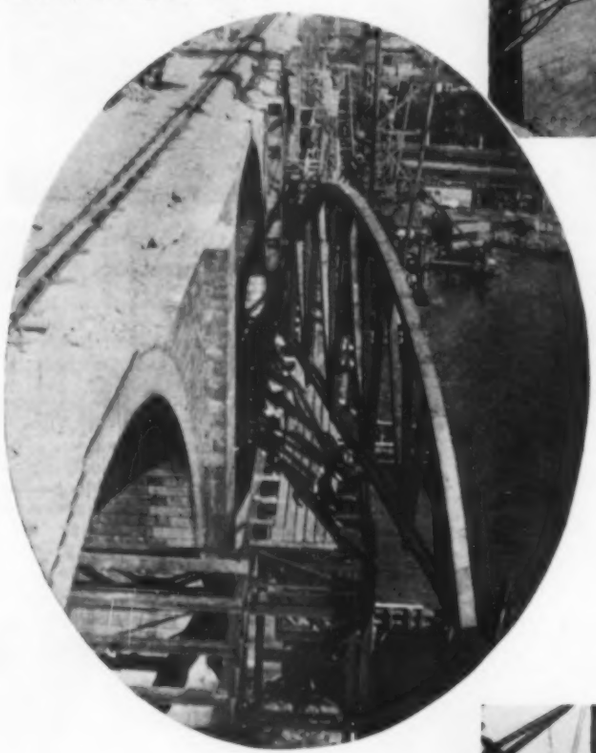
Wins Safety Award

FRANK N. GOBLE (fifth from left), president of Frank N. Goble, Inc., building contractor of White Plains, N. Y., receiving from Ninian Jamieson, president of the Westchester County Chapter, the Tubesing Cup, awarded by the Associated General Contractors of America for the accident prevention record established by his organization.



BEFORE RECONSTRUCTION. High Bridge, as completed in 1848 to carry the Croton aqueduct over the Harlem River, consisted of 15 granite masonry arches. River section has been removed and replaced by new steel span, as shown in picture at right.

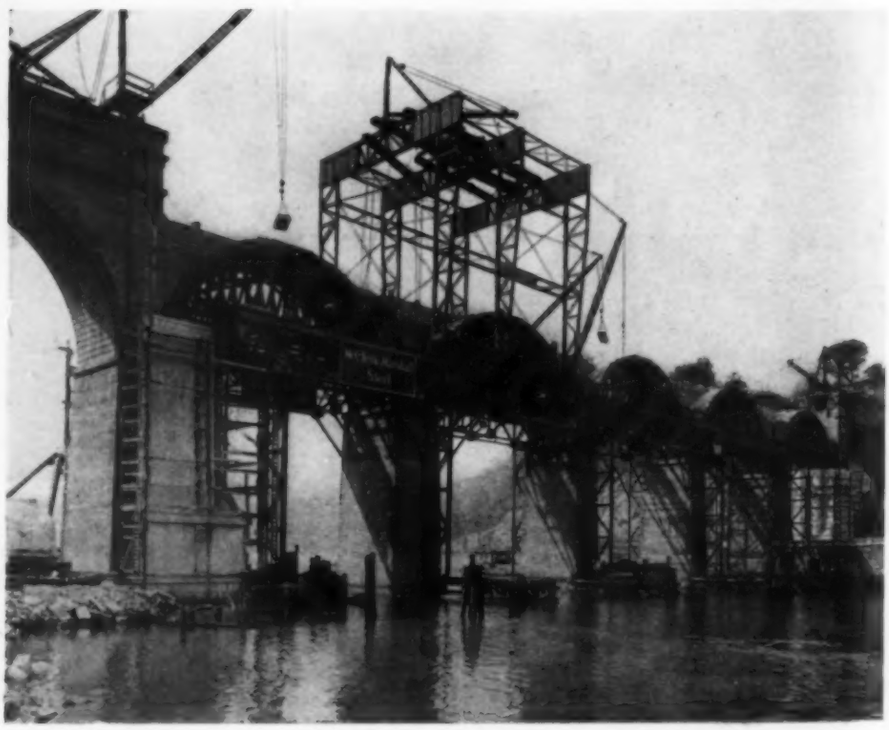
FALSEWORK TRUSSES, *(below)* with top chords curved to fit the old arch soffits, were swung into place and carried by chases cut in the old piers. These trusses supported the arch ring masonry during demolition.



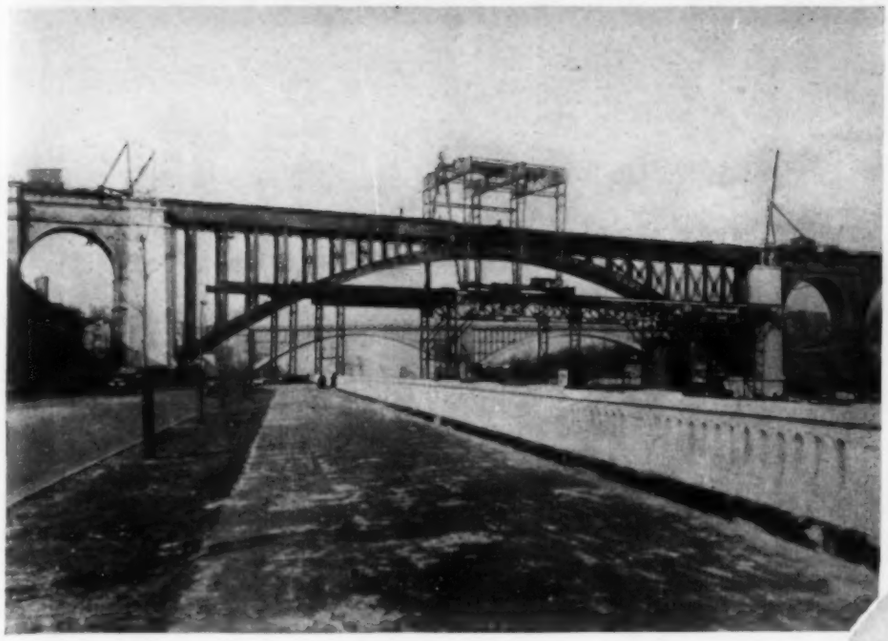
Old Masonry Arches Give HIGH

A NEW 426-ft. steel arch span now carries the Croton aqueduct over the Harlem River, New York City, in place of five of the masonry arches and four of the river piers of High Bridge, the famous old Roman-type aqueduct structure built 80 years ago. The reconstruction of the river crossing was undertaken by the Department of Plant and Structures of the city of New York to meet the War Department's requirements for an unobstructed river channel for navigation.

As originally built, the bridge, 1,197 ft. long, consisted of



GANTRY TRAVELER, with two large and one small derrick booms, handled both demolition and new steel erection. It was supported independently of the old structure by runways carried on steel trestle bents across the Harlem River.

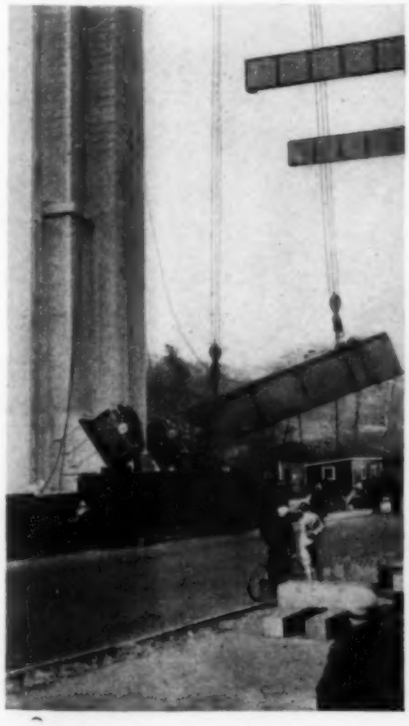


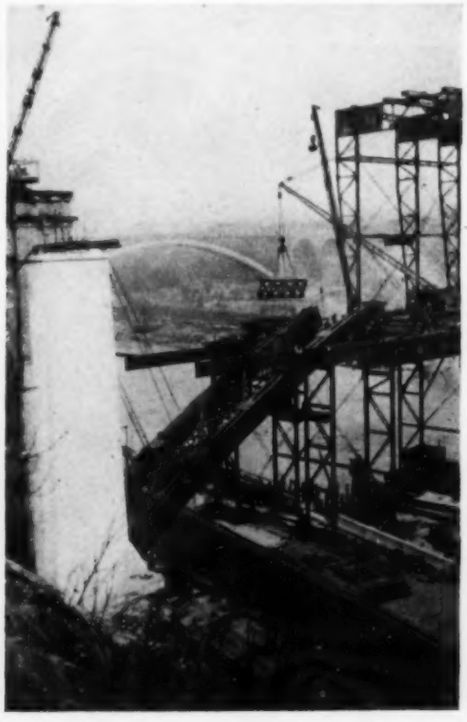
AFTER RECONSTRUCTION. New three-hinged plate-girder span, 426 ft. long between end pins, replaces old arches and piers, leaving channel of Harlem River unobstructed for navigation.

OLD AQUEDUCT pipe line, *(below)* of wrought iron, 90½ in. in diameter, and two 36-in. cast-iron pipe lines, were removed during reconstruction of bridge and later replaced on new steel span.

Way to New Steel Span at BRIDGE

14 granite masonry piers carrying 15 arches, eight of them, (including those crossing the river) with clear spans of 80 ft., and the other seven with spans of 50 ft. To the P. T. Cox Contracting Company of New York was awarded the general contract for removing the old river piers and arches and replacing them with the new steel span, the steel work being handled under a subcontract by the McClintic-Marshall Company. The old bridge carried two 36-in. cast iron and one 90½-in. wrought iron pipe line; the latter only has been replaced on the new steel bridge span.



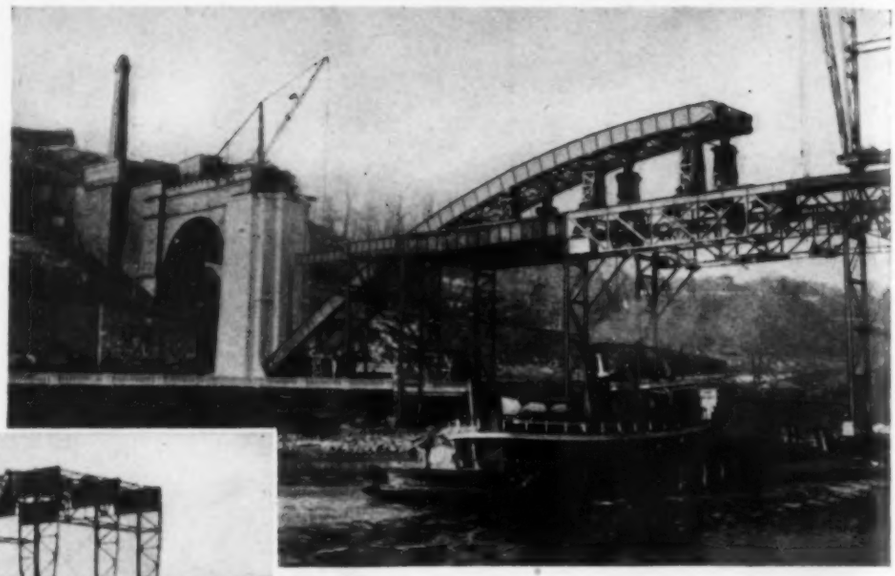


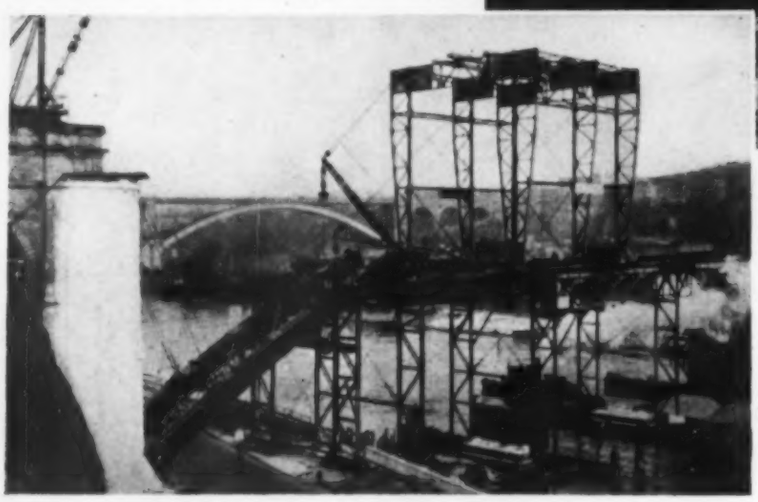
PLACING THE FIRST STEEL *(left)* in the new Harlem River span. Old pier was reinforced and jacketed with concrete lining and granite block facing. Same gantry traveler that demolished old masonry handled the steel for the new structure.

The contract, on which the bid price was $1,190,300, involved five major operations: (1) Demolition of the five masonry arches over the river; (2) removal of the four river piers; (3) reinforcement of abutment piers to carry the new arch; (4) erection of the new steel three-hinged plate girder span; (5) replacement of the aqueduct line on the new structure.

In deciding upon his plant layout for the job the contractor was influenced by two main considerations: (1) Minimizing the load to be placed on the old bridge during wrecking operations; (2) using the same equipment for demolishing the old masonry structure and erecting the new steel span. The plan followed involved the building of structural steel runways across the river on vertical column bents to support a large steel gantry traveler, equipped with a pair of 90-ft. derrick booms at one end and with a small stiff-leg derrick on the upper deck at the other end. Thus the old masonry structure was entirely relieved of the weight of the gantry traveler. Two additional stiff-leg derricks, one mounted on each of the two end piers of the river crossing, and railway track and cars operating along the tops of the old arches completed the major items of the contractor's plant.

It was necessary, of course, to pro-

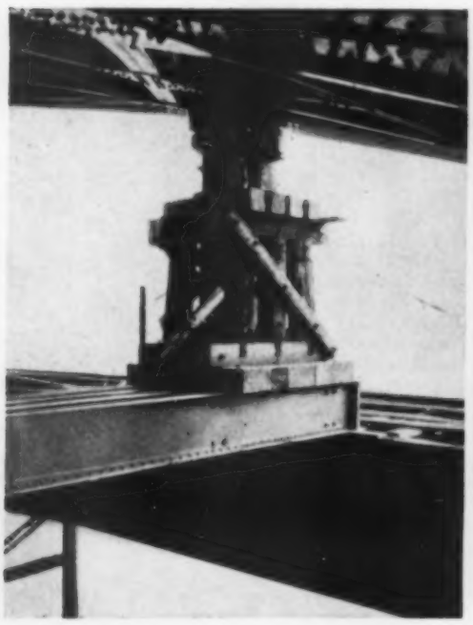




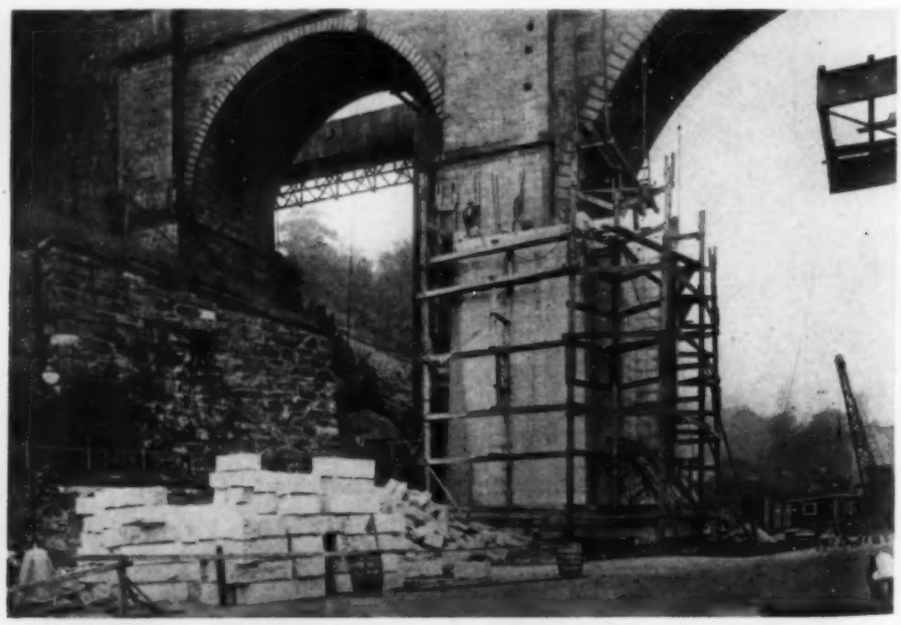
HALF-WAY ACROSS. Showing *(above)* how the gantry runway structure served also as falsework from which to block up the new steel span.

TALL GANTRY *(left)* was equipped with two 90-ft. derrick booms. Stiff-leg derricks also were set up on each end pier.

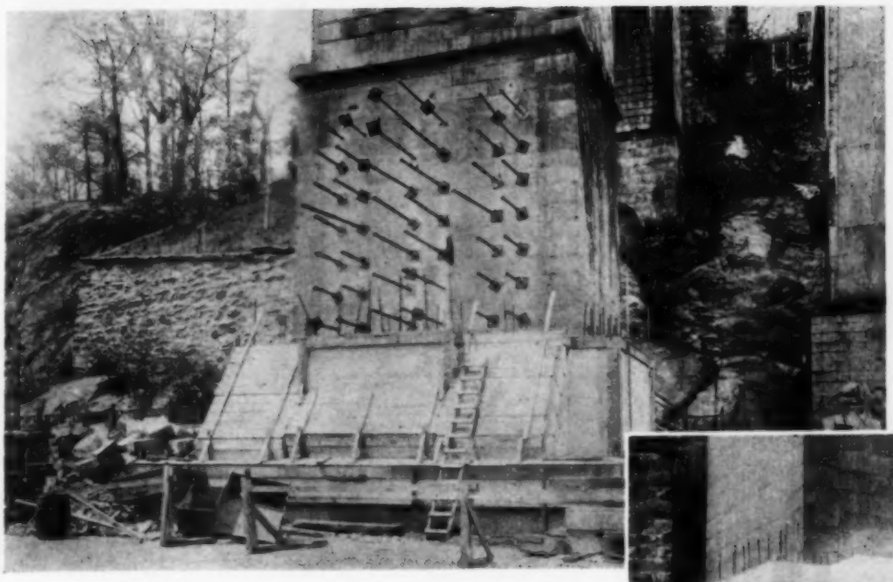
JOHN R. FLICK, superintendent for the P. T. Cox Contracting Co.



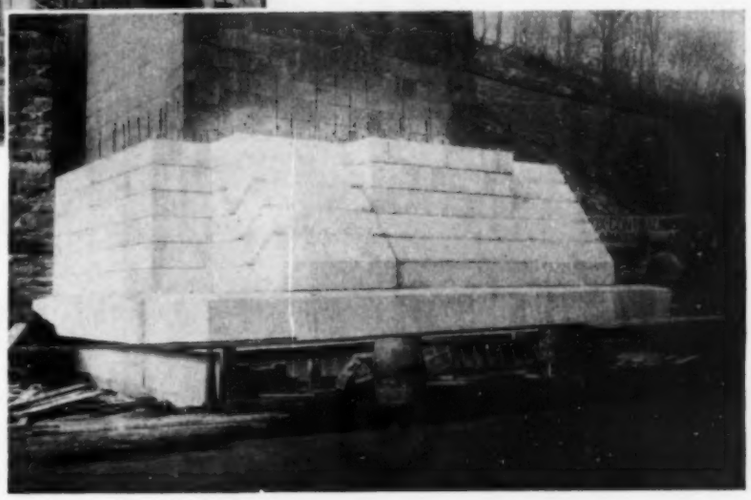
DETAIL of support for new steel span on crane runway structure.



REINFORCING one of the piers of the old bridge to serve as an abutment for the new steel span. Granite blocks surround jacket of concrete.



PIER STRENGTHENING DETAILS, showing rods to tie concrete jacket to old masonry and outer lining of massive granite blocks.



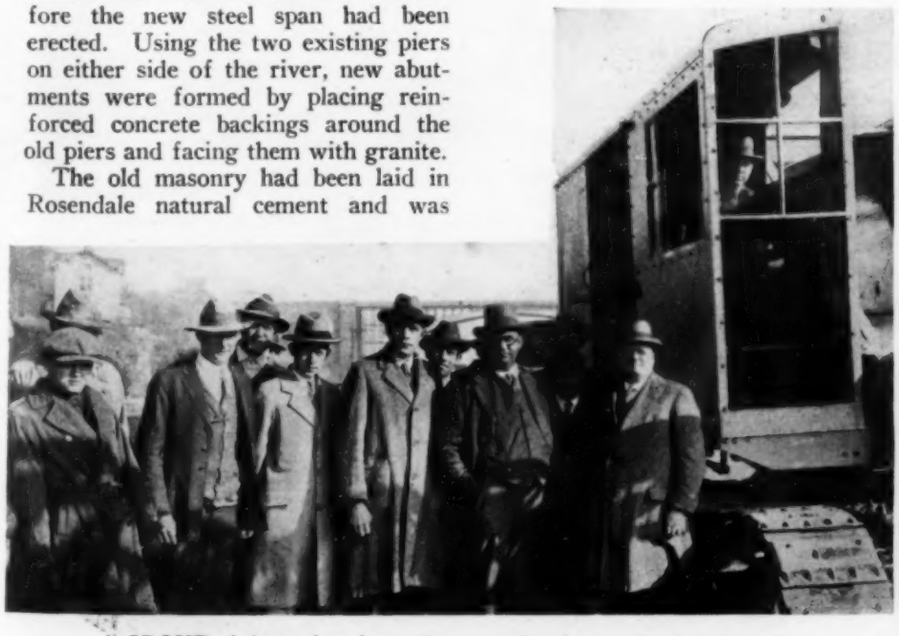
P. T. COX *(left)* president of the general contracting company that bears his name.

vide means of holding the old portion of the bridge in place after the river arches had been broken out and before the new steel span had been erected. Using the two existing piers on either side of the river, new abutments were formed by placing reinforced concrete backings around the old piers and facing them with granite.

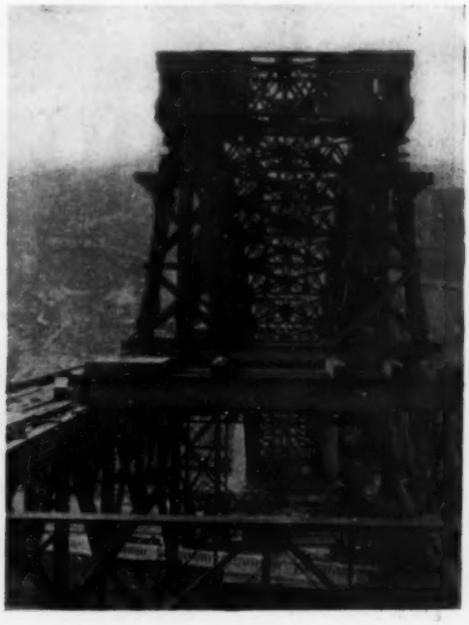
The old masonry had been laid in Rosendale natural cement and was broken out by hand barring and wedging, supplemented by the use of pneumatic drills and paving breakers. After the old masonry had been taken out to the tops of the arch rings, falsework trusses with tops curved to fit the arch soffits and lagged with transverse planks were raised and placed to support the masonry during the final stages of demolition. These trusses were carried at the end by chases cut in the old masonry piers. With the trusses in place, the contractor first removed the outside one-third of the arches and, last, the middle third, thus reducing the weight imposed on the centering at any one time.

After the removal of the old masonry structure, the gantry traveler, carried independently on its cross-river runways, as shown in the pictures, was free to attack the final stage of the job—the erection of the new steel arch span. This structure is of the three-hinged plate girder type.

For the Department of Plant and Structures, which planned and supervised the reconstruction work, Edward A. Byrne is chief engineer, and Francis W. Perry, engineer in charge of the High Bridge work. John R. Flick served as superintendent for the P. T. Cox Contracting Company while G. A. McClain acted as superintendent for the McClintic-Marshall Company.



A GROUP of the engineering and construction forces, showing Commissioner Albert Goldman of the Dept. of Plant and Structures (in the crane cab) and Edward A. Byrne, chief engineer, *(extreme right)*.



TIMBER TRESTLE BENTS on crane runway structure temporarily supporting steel for new bridge.

ALL THAT WAS LEFT of the St. Francis dam after its foundation failed March 12.

CATERPILLAR TRACTOR rushes timber to site of bridge washout on Santa Clara River near Castiac.

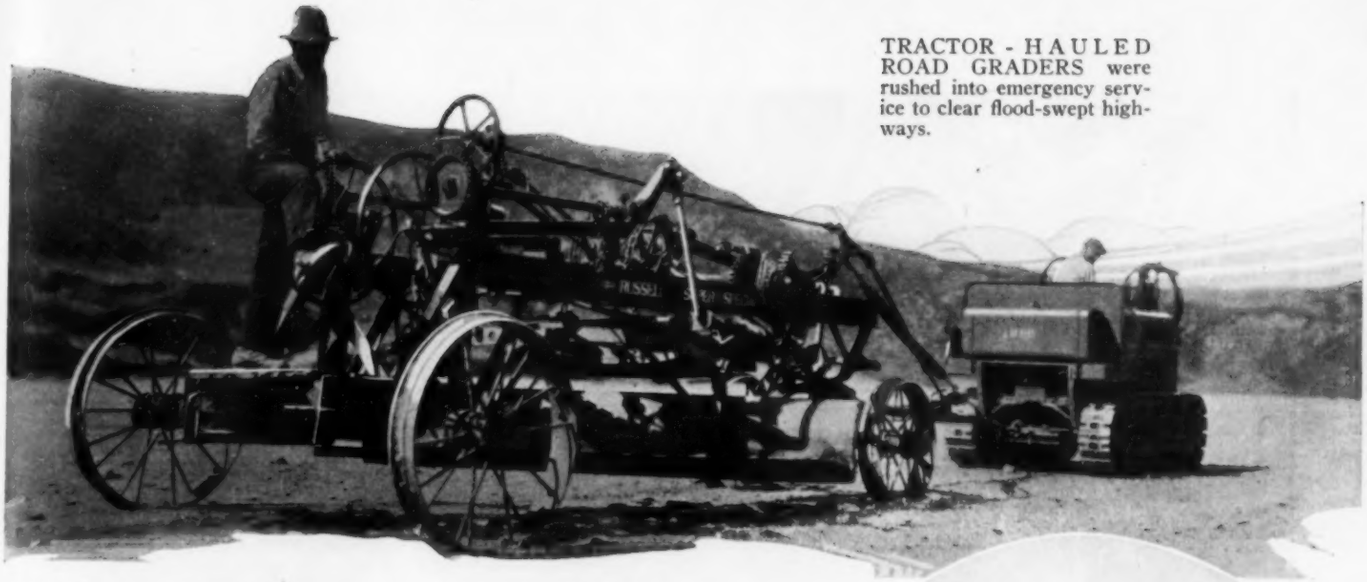
After the Dam

ALONG the 60-mile path of death and destruction created by the failure, March 12, of the St. Francis dam, one of the structures of the Los Angeles aqueduct system, California's engineers and contractors are busy on the huge task of salvage and reconstruction. Material for repairs to roads, bridges, culverts, railway track, telegraph and telephone lines, and other structures was rushed to the scene of the catastrophe and mobile construction equipment, including tractors, trucks, locomotive cranes, power shovels, blade graders, and piledrivers, was drafted

BEGINNING WORK on highway bridge reconstruction near Saugus with blade grader and tractor at work on road repairs.

©Wide World Photos

(*In oval*) SNAKING uprooted trees from highway right-of-way.



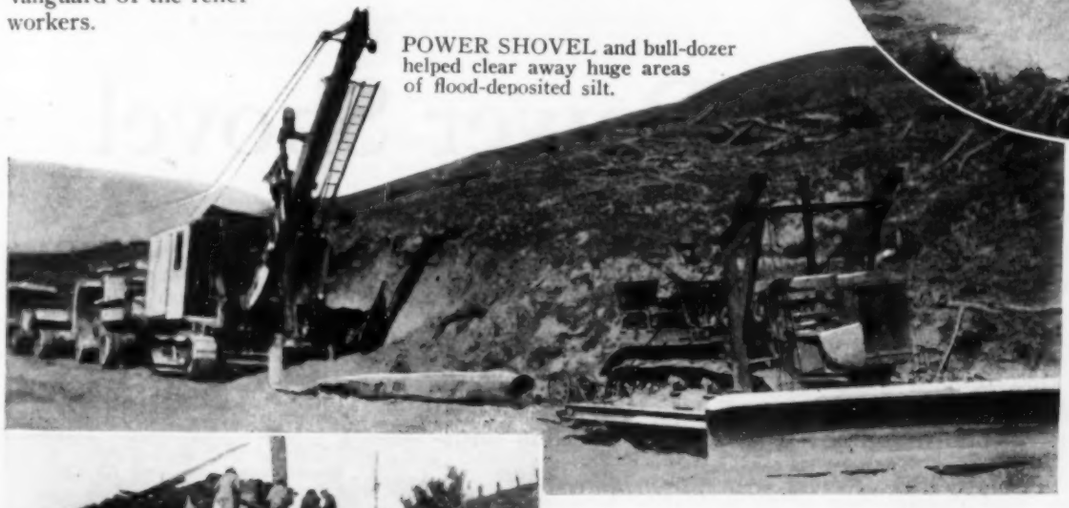
TRACTOR - HAULED ROAD GRADERS were rushed into emergency service to clear flood-swept highways.

Had Gone Out

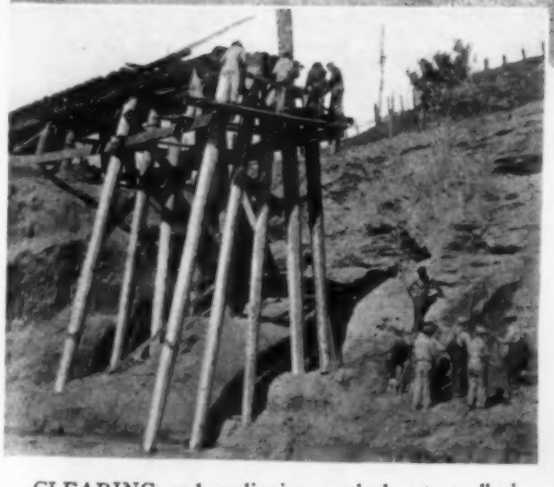
into emergency service for clearing away the wreckage and reconstructing or replacing necessary service facilities in the ill-fated Santa Clara valley.

The wide range of cleanup and repair operations under way and the equipment used therefor are indicated in the accompanying pictures, a number of them taken by F. H. Higgins, of the Caterpillar Tractor Co. of San Leandro, Calif., who made a trip through the flood-swept area with the vanguard of the relief workers.

POWERFUL FLOOD-LIGHTS, mounted on trucks, were loaned by the movie studios to aid night work.

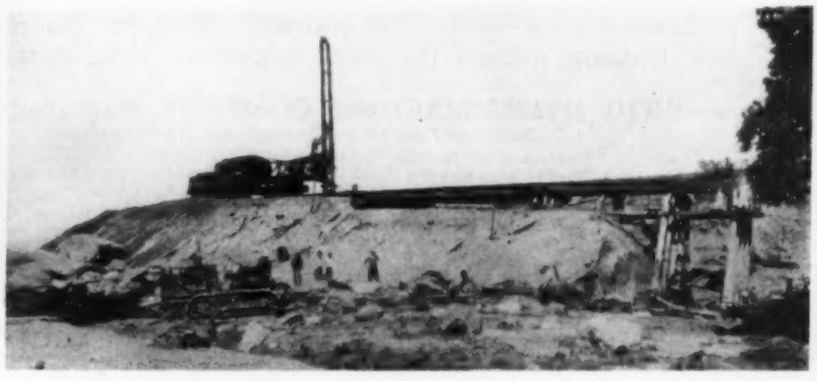


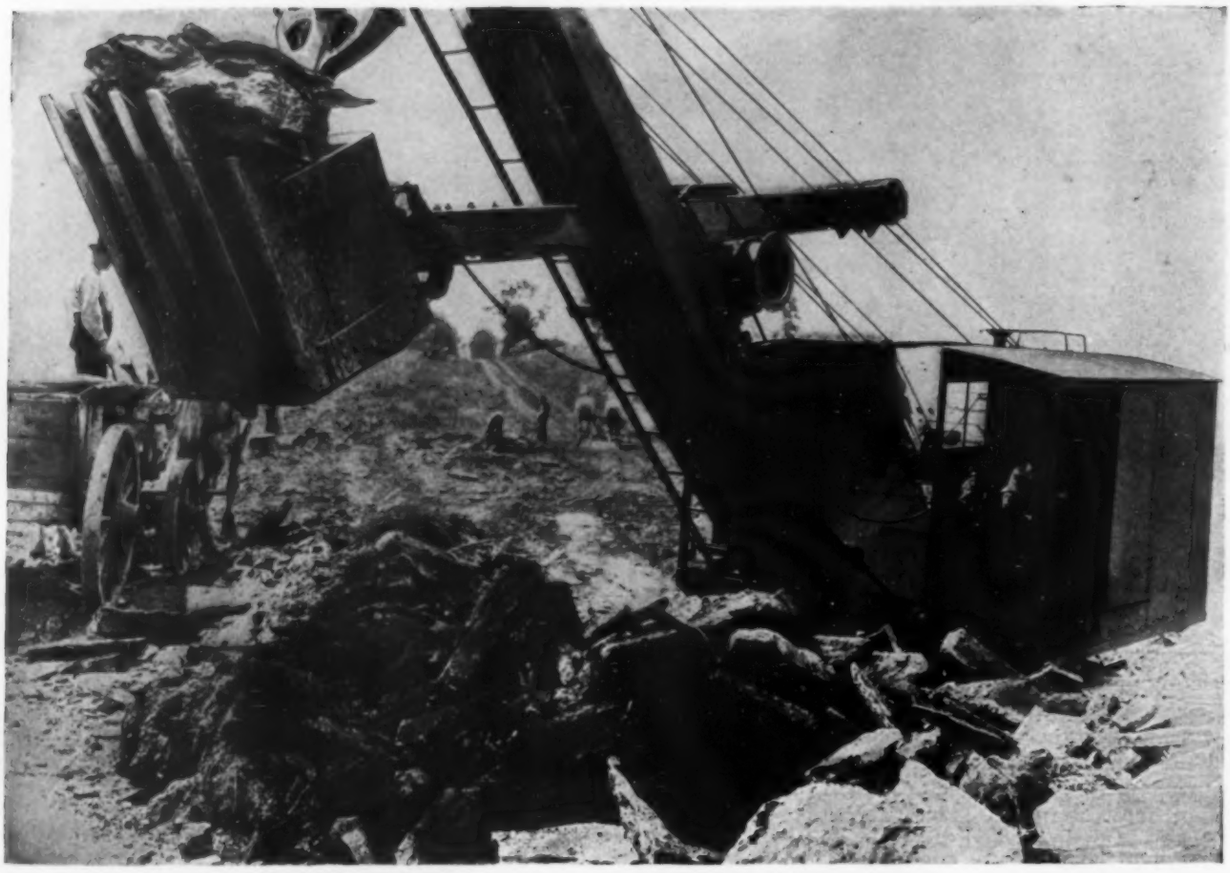
POWER SHOVEL and bull-dozer helped clear away huge areas of flood-deposited silt.



CLEARING and realigning washed out roadbed before rebuilding Southern Pacific Railway bridges.

PILEDRIVER AND TRACTOR (*below*) helped the Southern Pacific Railway replace a washed-out railway bridge.





This Byers-Massillon owned by Martin Wunderlich, St. Paul, made a wonderful record digging and loading this rock, without shooting. Ruggedness, power and speed win out for the "Master" shovel repeatedly in competition with other machines, both gas and steam.

A *Great* Gas Power Shovel

EVERY shovel man who sees the "Master" knows it is a great shovel.

They can see it is not a steam shovel adapted to gasoline power —nor a gasoline crane converted to a shovel.

They realize the "Master" is by virtue of original design just what it was intended to be, a *Gas Power Shovel.* In simplicity, speed, power and ruggedness—that combination of qualities so difficult to present in one machine—the "Master" stands without an equal.

The knowledge and experience of thoroughly seasoned men who have spent years in designing and building steam shovels as well as gas powered machines, are combined in the "Master" design.

Look it over—judge for yourself. Send for the new "Master" Catalog, just off the press this week. Wire or write.

BYERS-MASSILLON BM CRANES SHOVELS

THE BYERS MACHINE COMPANY, Ravenna, Ohio

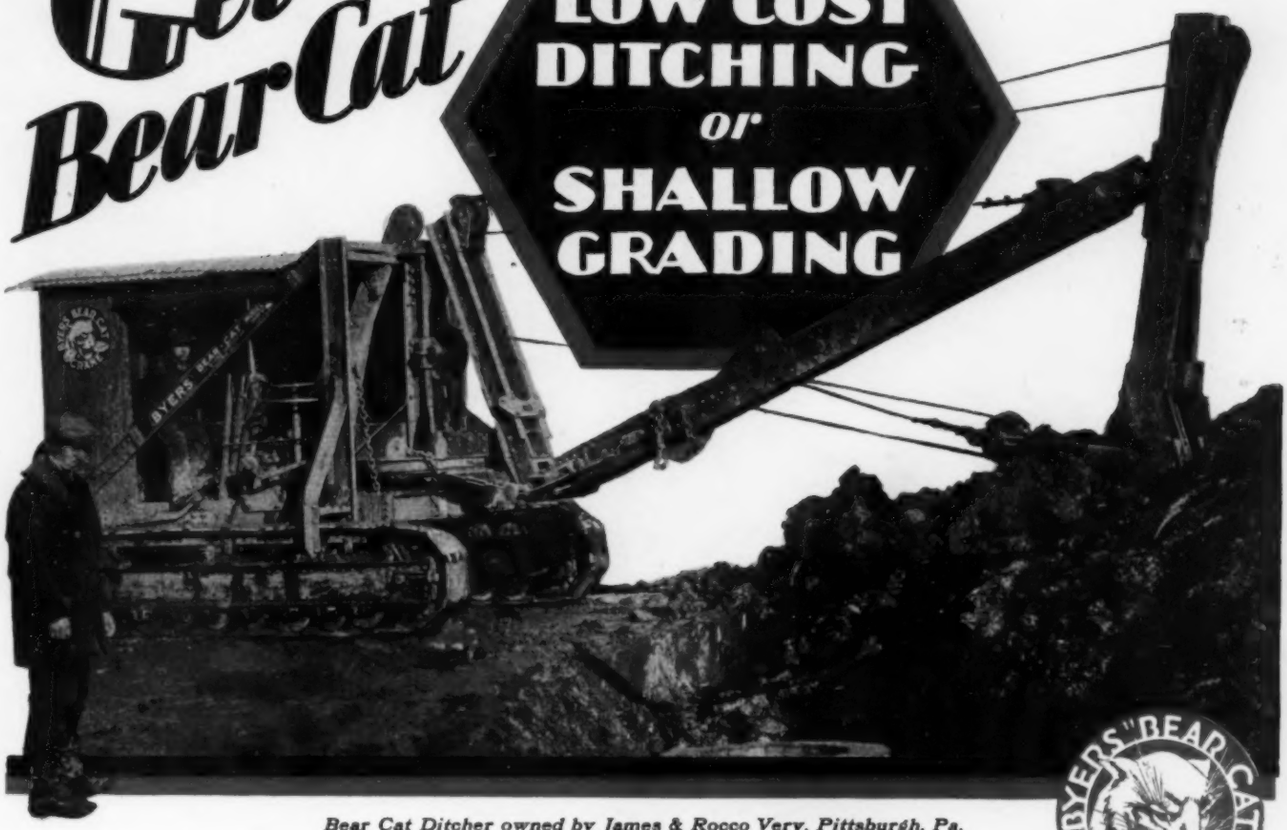
Sales and Service Throughout the Country

Builders of the Bear Cat (½ yard), the Bear Cat "Whirly" (¾ yard), "Master" Gas Shovels (1 and 1¼ yards), and Massillon Steam Shovels

BYERS "Master" Shovel

1 and 1¼ Cu. Yard Gas

Get a Bear Cat for LOW COST DITCHING or SHALLOW GRADING



Bear Cat Ditcher owned by James & Rocco Very, Pittsburgh, Pa.

THE reason so many Bear Cats are to be found digging ditches and grading roads is simply this:

The Bear Cat "delivers the goods" at the lowest cost.

Byers policy is to give most value per dollar to Byers customers, and it is that policy which insures your satisfaction.

The new Bear Cat is the best yet.

Send the coupon or wire for full information.

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Builders of the "Master" Shovels, 1 and 1¼ yards; The Bear Cat, ½ yard; The Bear Cat "Whirly", ⅝ yard; and the Massillon Steam Shovels.

BYERS BEAR CAT

THE ALL-PURPOSE ONE-MAN CRANE SHOVEL-DITCHER

Bear Cat Skimmer tearing up old street for resurfacing, in St. Louis, Mo.

THE BYERS MACHINE CO.
Ravenna, Ohio

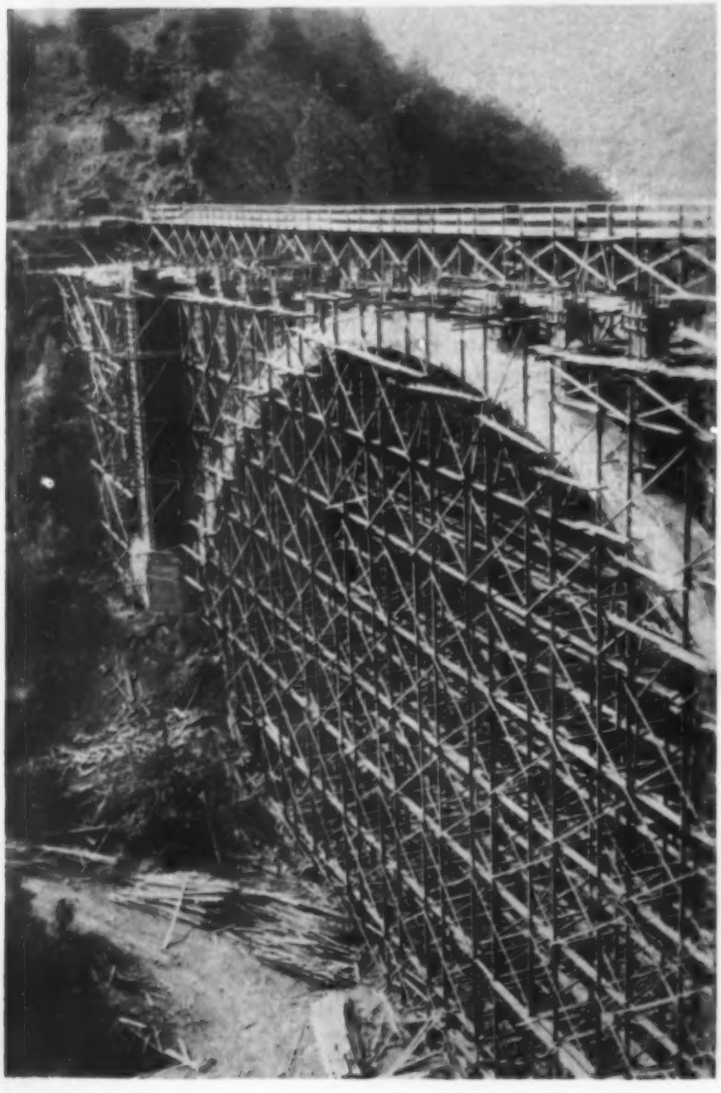
Send the Booklets checked that we may become further acquainted with The Great Byers Line.

- ☐ Byers Bear Cat, ½ yard, half-circle.
- ☐ Byers Bear Cat "Whirly," ⅝ yard, full-revolving.
- ☐ Byers Master Shovels, 1 and 1¼ yds.

Signed .....
Firm .....
Address .....
City ..... State .....

C.M. 5-28

This Month's Prize Winners



WHILE THE COOLIDGE DAM *(above)*, a concrete structure of the multiple dome type 260 ft. high from base to top, is being built in Arizona for the Bureau of Reclamation by Atkinson, Kier Bros. & Spicer, engineers of the U. S. Bureau of Public Roads are planning the relocation and rebuilding of 50 miles of highway around the area that will be submerged when the reservoir is filled. The power shovel in the upper right-hand corner is grading for the new road which will cross the completed dam.

First Prize $25.00

Won by GEORGE D. WHITTLE,
Bridge Engineer, U. S. Bureau of Public Roads,
San Francisco, Calif.

FALSEWORK *(left)*, 110 ft. high, for the 234-ft. concrete arch of the Dog Creek bridge in the Sacramento Canyon, California, under construction by Bordwell & Brugge, contractors, of Napa, Calif., for the state highway commission, as a Federal aid project.

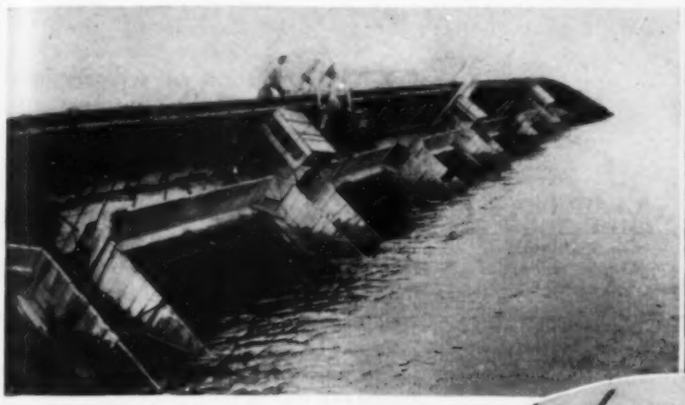
Photo Contest Rules

NEXT month *Construction Methods* will conclude its photographic contest by awarding three prizes of $25, $15, and $10 for the most useful, novel, and attractive pictures, to appear in the June issue.

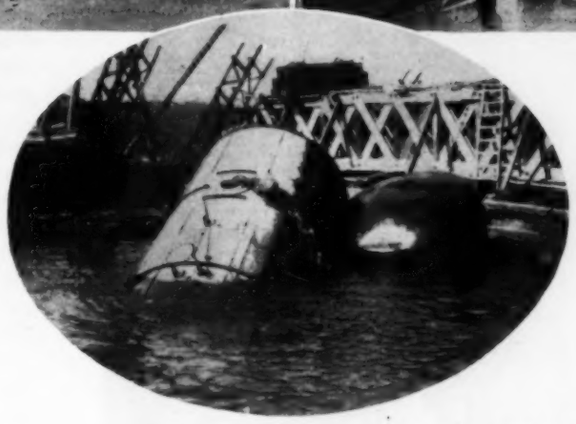
For the June contest, which closes May 9, the conditions are: Pictures must be submitted to *Construction Methods*, Tenth Avenue at Thirty-sixth Street, New York City, by a man regularly employed on the job, even though he may not have taken the pictures himself. The pictures should be plainly marked "Photographic Contest."

Water-works construction photos are particularly desired for the June contest.

in the Photographic Contest

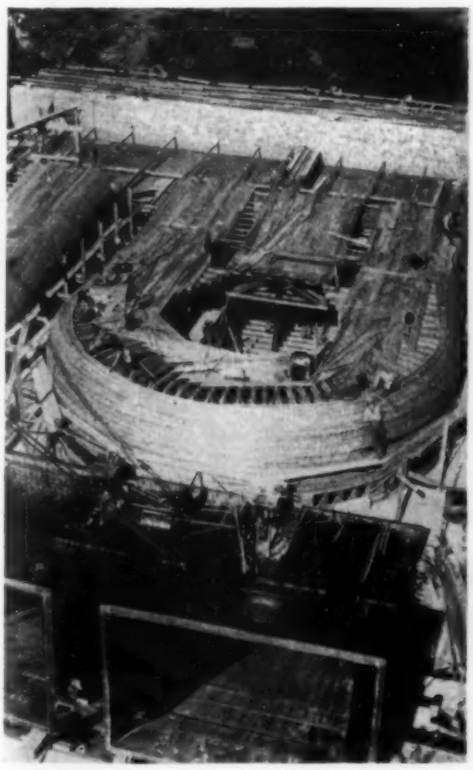


WHEN ONE OF THE CAISSONS being sunk for the pier substructure of the mid-Hudson bridge at Poughkeepsie, N. Y., tilted at an angle of about 40 deg., due to a slip of the underlying material, large cylindrical steel pontoons were placed in service as an important part of the contractors' equipment for righting the structure. The pier caissons, with false-bottoms, are of structural steel and concrete, 60x130 ft. in plan, divided into 25 dredging wells by cross walls. At the site shown in the photographs the depth of water is 55 ft.



Second Prize $15.00

Won by JOHN W. JACOBS,
Paymaster, Blakeslee & Rollins Corporation,
Poughkeepsie, N. Y.



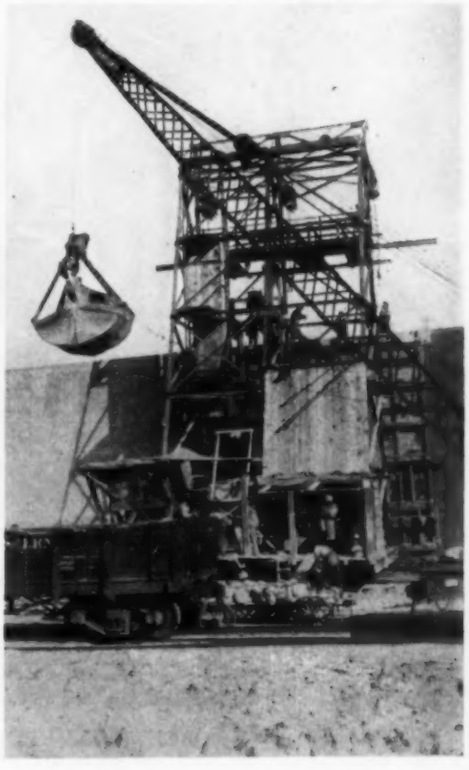
SCROLL CASE FORMS *(left)* for the Hodenpyl dam and power project on the Manistee River in Michigan for the Consumers Power Company.

MIXER PLANT AND TRAVELER *(right)* for raising and moving forms of the sectional type for the corewall of the Hodenpyl dam.

Third Prize

$10.00

Won by
GEORGE J. HENSHAW,
Jackson, Mich.



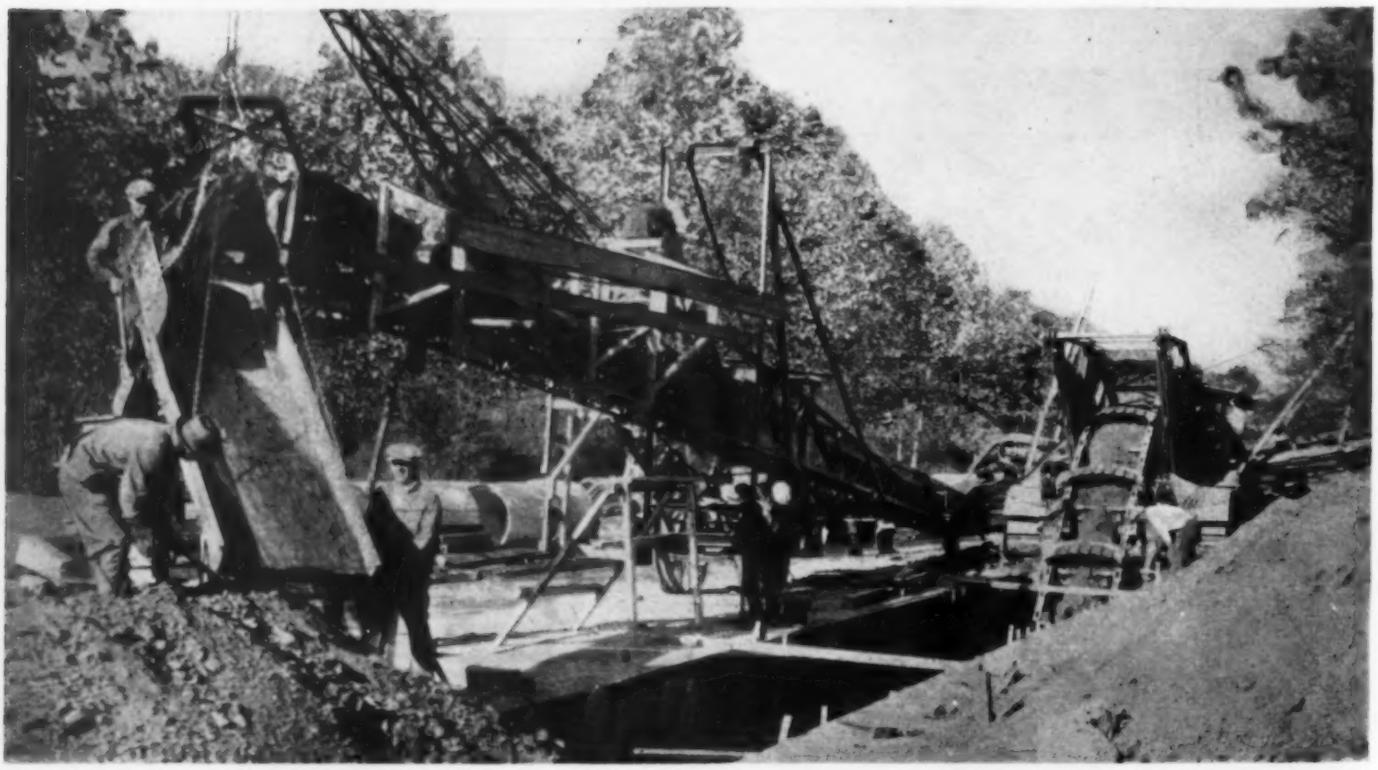
Contractor Fits Brand New Plant

A PAIR OF "MUD-HOGS" with double diaphragms keep the trench water level down.

THE question of whether it is more profitable to buy new equipment to fit the job or to get along with machines already in stock is vital to every contractor. One organization that is firmly converted to the policy of equipping its jobs with the most efficient plant obtainable is the Krenn & Dato Building & Construction Company of Chicago. On the 7-mile Pleasant Run sewer which it is building for Indianapolis at a cost of $750,000 the policy has been to provide machines fitted to the work—no makeshifts are allowed.

Two Sets of Conditions—The sewer job naturally divided itself into two parts. For 5 miles 48-in. precast concrete pipe is laid through sand and gravel from 12 to 33 ft. below ground level. Cutting a trench with vertical banks through this unstable material, containing much ground water, would have required close sheeting and involved great expense. It was decided, therefore, to use a dragline and slope the banks.

DRAGLINE *(left)* Diesel-powered and with special 1¾-yd. bucket, excavates trench while crawler-mounted crane handles pipe sections.



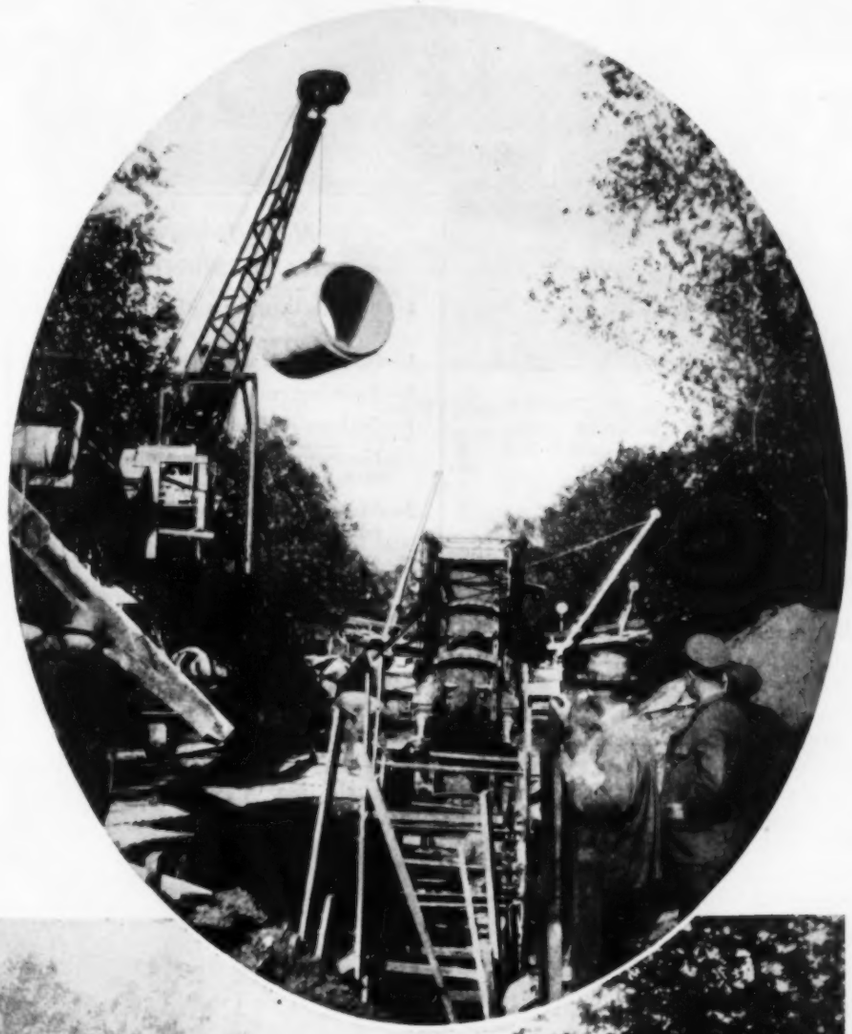
BELT CONVEYOR carries excavated material from trenching machine and backfills it on top of newly laid concrete pipe. Sheet piling sloped at angle of trencher boom.

to Big Sewer Construction Job

On the remaining 2 miles, where 42-in. pipe is laid, the material contains clay along with the sand and gravel, making it fairly stiff; vertical banks could be held with skeleton sheeting. For this section a trench excavator was selected as the economical tool.

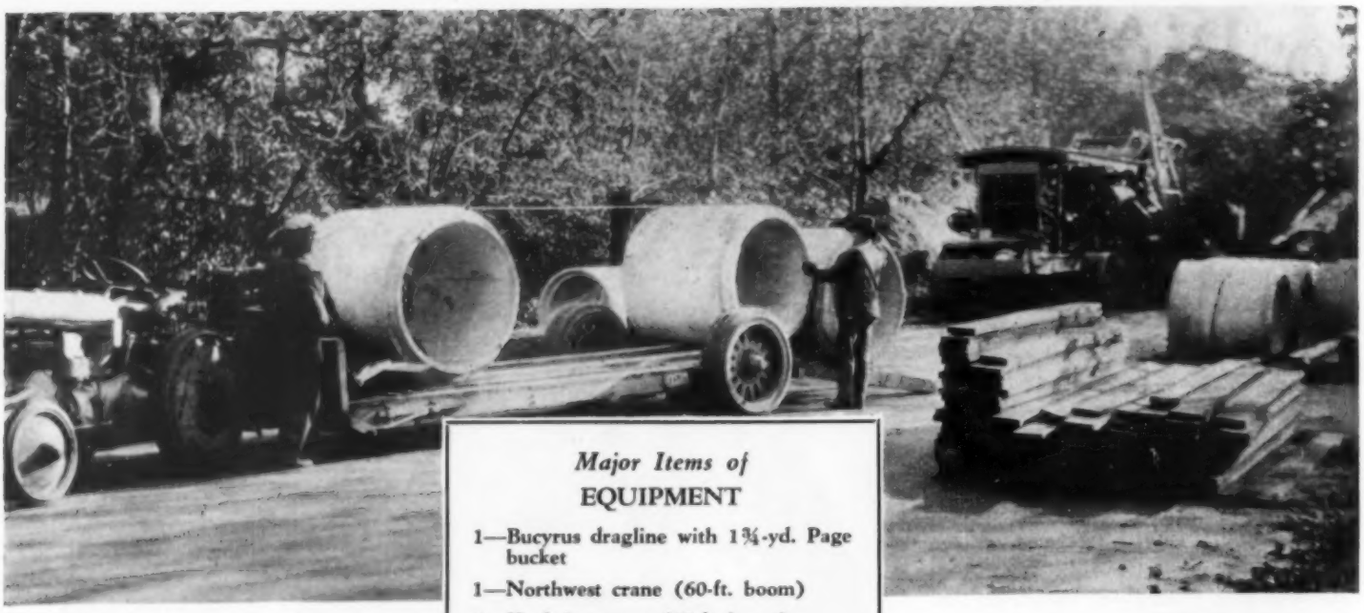
Excavation by Dragline—In procuring equipment for the 5-mile section the work to be done, and not the price of the machine, was the item considered important. To handle the heavy yardage of excavation a fast digging machine was needed. Low operating cost was also a deciding factor, as the equipment would be used daily for a year. To meet these conditions the contractor purchased a 50-B Bucyrus dragline powered by a Diesel engine.

Because the dragline had power to pull a larger bucket than the 1½-cu.yd. size for which it is rated, a special Page bucket of 1¾-cu.yd. capacity was ordered. The dragline with special bucket operates at a fuel cost of less than $2 a day. A Northwest gasoline



KEEPING IN STEP with the ditcher *(right)*. As fill is delivered back into the trench direct from the buckets via the belt conveyor, the crane must time accurately the laying of the pipe sections.

MECHANICAL TEAMWORK—Ditcher, belt conveyor and locomotive crane worked together smoothly.



CONCRETE PIPE SECTIONS, delivered by tractor-trailer outfit, are unloaded by hand winch and cable.

crane with a 60-ft. boom lowers the pipe into place and backfills the ditch on the 5-mile section.

Excavation by Ditcher — On the 2-mile section, which a Buckeye ditcher, with side cutters, is excavating, a Northern portable conveyor, 70 ft. long, handles the backfill. The conveyor receives the excavated material from the belt of the ditcher, carries it to the rear, and casts it on top of the newly laid pipe. A Koehring crane lowers the pipe sections into the trench between the ditcher and the rear end of the conveyor.

Major Items of
EQUIPMENT

1—Bucyrus dragline with 1¾-yd. Page bucket

1—Northwest crane (60-ft. boom)

1—Koehring crane (40-ft. boom)

1—Buckeye ditcher with side-cutters

1—Northern (70-ft.) portable belt conveyor

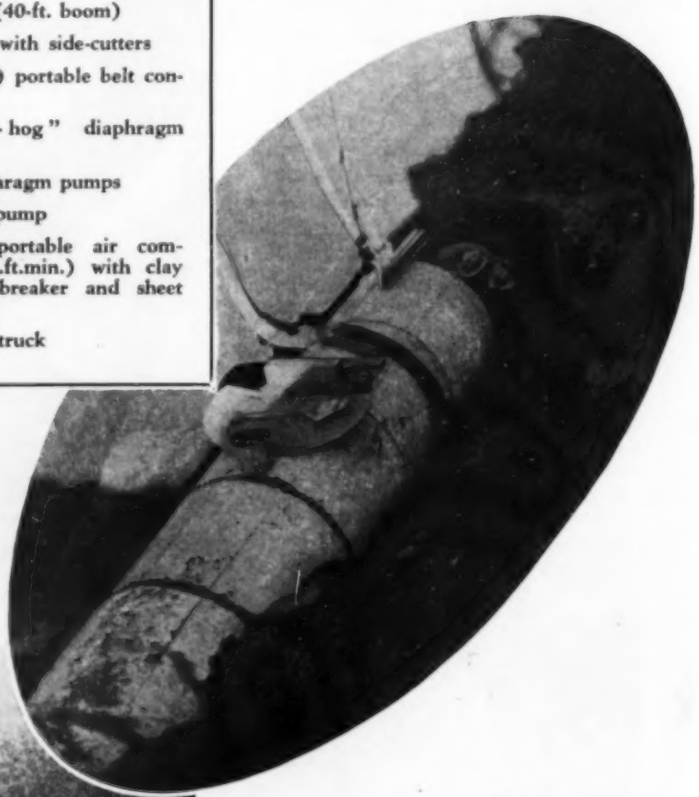
3—Marlow "mud-hog" diaphragm pumps

2—C. H. & E. diaphragm pumps

1—3-in. centrifugal pump

1—Ingersoll-Rand portable air compressor (190 cu.ft.min.) with clay spades, paving breaker and sheet pile hammers

1—2½-ton Sterling truck



JOINTING the sections *(right)* of precast concrete pipe.

PULLING SHEETING with one of the locomotive cranes.

The ditcher is capable of digging a trench 84 in. wide and 24 ft. deep. On this section of the sewer it is cutting a 72-in. trench to an average depth of 21 ft. Skeleton sheeting is sloped at the angle of the cut made by the ditcher and is installed close behind it.

Precast concrete pipe for both sections of the job was made and delivered by the Independent Concrete Pipe Company.

The Pleasant Run sewer construction is under the supervision of E. T. Murchison, assistant chief engineer in charge of field work for the Krenn & Dato organization; C. B. De Tar is superintendent.

COMING

How a Reservoir Lining Was Made Watertight

Who's Getting the Big Contracts?

A Monthly Guide to Where the Construction Dollar is Being Spent

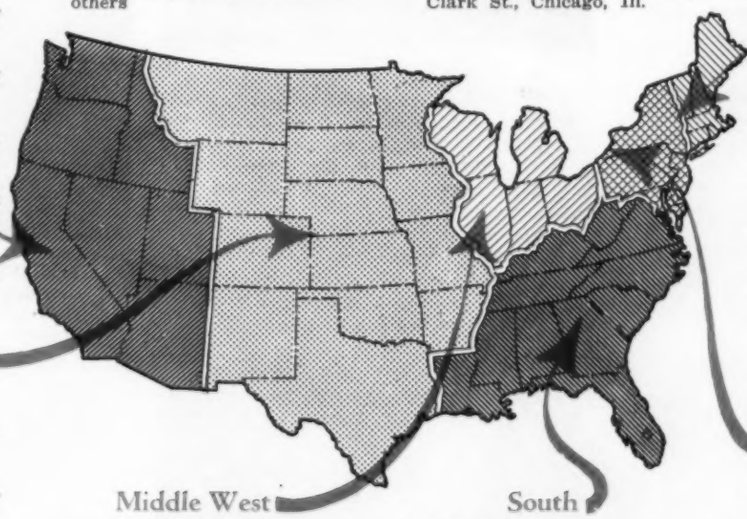
The MAN *and the* JOB

ON THIS PAGE *Construction Methods* lists some of the high-spot jobs for which important contracts have recently been let.

If you are looking for an opening in new territory, the information on this page may be of help in indicating where construction is active.

The contracts listed are, of course, only a few of the total number recently let. You may wish to ask about others. If so, address your inquiries to:

The Editor, *Construction Methods*,
Tenth Ave. at 36th St., New York



Pacific Coast

Arizona
Railway: $2,450,000
Utah Constr. Co., Phelan Bldg. San Francisco

Pasadena, Calif.
Apartment: $2,250,000
Orndorff Constr. Co., 347 North Western Ave., Los Angeles

San Francisco, Calif.
Refrigerator cars: $3,000,000
Pacific Car & Foundry Co., Alaska Bldg., Seattle, Wash.

Sacramento, Calif.
Office and garage: $1,250,000
Campbell Constr. Co., 300 R St.

Seattle, Wash.
Office: $1,500,000
Teufel & Carlson, Skinner Bldg.

Store: $3,000,000
Teufel & Carlson, Skinner Bldg.

Glendale, Calif.
High school: $796,400
C. Thoren, 5616 West 4th St., Los Angeles

Washington
Roads: $277,965
C. J. Erickson, 1045 Henry Bldg., Seattle

Los Angeles, Calif.
Science buildings: $628,875
Pozzo Constr. Co., 421 Macy St.

Seattle, Wash.
Street lighting: $353,676
C. B. Campbell Electric Co., 518 Seneca St.

San Diego, Calif.
Paving: $325,723
United Concrete Pipe & Constr. Co., 1151 South Bway., Los Angeles

Oakland, Calif.
Administration: $600,000
P. J. Walker Co., Sharon Bldg., San Francisco

West of Mississippi

Kansas City, Mo.
Apartment: $1,350,000
C. O. Jones (by day labor), Continental Bldg.

St. Louis, Mo.
Hotel: Est. $1,500,000
P. J. Bradshaw, archt., International Life Bldg., Separate contracts

Hotel: Est. $1,200,000
J. W. Kopman Constr. Co., 594 Arcade Bldg.

San Angelo, Tex.
Hotel: Est. $1,000,000
B. B. Hall, San Angelo

St. Louis, Mo.
Street lighting: $2,235,985
G. Locke Tarlton, Buder Bldg.

Apartment: Est. $1,200,000
McKelvey-Carter Constr. Co., 3800 West Pine Blvd.

Malvern, Ark.
Textile mill: $1,000,000
International Shoe Co., 1501 Washington Ave., St. Louis, Mo. By day labor

Jefferson Barracks, Mo.
Shop: $788,000
Murch Bros. Constr. Co., Railway Exchange Bldg., St. Louis

Waco, Tex.
Medical Arts: $400,000
Churchill-Humphrey Co., 207 Magnolia Bldg., Dallas

St. Louis, Mo.
Bakery and warehouse: Est. $700,000
Austin Co., 16112 Euclid Ave., Cleveland, O.

Midland, Tex.
Storage tanks: $750,000
Reeves Constr. Co., Midland

Texas
Roads: Total: $1,610,848
Tibbetts Constr. Co. ($429,165), Joseph Bldg., Ft. Worth, Womack Constr. Co. ($295,813), Box 664, Sherman and others

Iowa
Grading, paving: Total, $2,862,864
($884,236) Harrison Eng. and Constr. Co., Mutual Bldg., Kansas City, Mo., ($784,638) Nat'l Constr. Co. 1315 South 20th St., Omaha, Neb., ($492,650) A. F. Johnson Constr. Co., Minneapolis, Minn. and others

B-W. Constr. Co., 720 Cass St., Chicago, Ill.

Open hearth furnace: Est. $500,000
Raymond Concrete Pile Co., Keith Bldg.

Appleton, Wis.
Apartment, store and theatre: Est. $750,000
Lorenz-Redding Co., 10 North Clark St., Chicago, Ill.

Middle West

Chicago, Ill.
Theatre and office: $20,000,000 (Est.)
John Griffiths & Son Co., 228 North La Salle St.

Hotel: Est. $1,000,000
Masonry, W. G. McNulty & Bro., 58 E. Washington St.

Cold storage: Est. $2,000,000
Wells Bros. Constr. Co., 53 West Jackson Blvd.

Club, office and store: $4,000,000
Paschen Bros., 111 West Washington St.

Office and printing: Est. $10,000,000
Hegeman-Harris Co., 431 North Michigan Ave.

Stadium and soldiers' field: $1,300,000
John Griffiths & Son Co., 228 North La Salle St.

Apartments: $1,500,000 (Est.)
Nelson Building Constr. Co., 4440 North Kedzie Ave.

Apartment: Est. $1,000,000
Masonry and concrete, Adolph Lindstrom & Co., 77 West Washington St.

Apartment: Est. $750,000
Masonry, Wahl Constr. Co., 3310 Belmont Ave., Carpentry, A. Smith, Chicago

Cincinnati, Ohio
Garage: $1,000,000
Hodges Constr. Co., 901 Chamber of Commerce Bldg.

Cleveland, Ohio
Retail stores and warehouses: Est. $650,000

South

Richmond, Va.
Rayon silk plant: $10,000,000
Du Pont Eng. Co., Wilmington, Del.

Winston-Salem, N. C.
Store: $700,000
Walter Kidde Co., Greensboro

New Orleans, La.
Hotel: $278,515
Estrade & Scaffel, New Orleans

Louisville, Ky.
Factory: $100,000
J. E. Boswell & Co., 1107 East Bway.

Kentucky
Roads: $204,848
Hatfield Constr. Co., Huntington, W. Va.

Charleston, W. Va.
Hotel: $475,500
A. G. Higginbotham, Charleston Natl. Bank Bldg.

Birmingham, Ala.
Office: $457,000
Foster & Creighton, 1st Natl. Bank Bldg.

Winston-Salem, N. C.
Church: $500,000
Jacob & Young, Inc., 116 West 32nd St., New York

Florida
Roads: $739,245
R. C. Huffman Constr. Co. ($274,216), Miami. C. A. Steed & Sons ($378,257), West Palm Beach. And others.

New England

Weymouth, Mass.
Plant: Est. $5,000,000
Stone & Webster, Inc., 49 Federal St., Boston

Boston, Mass.
Apartment: $2,500,000
Esplanade Realty Trust, D. & S. Stern, 295 Washington St. (Separate contracts)

Springfield, Mass.
Hotel: Est. $400,000
E. J. Pinney Inc., 220 Dwight St.

Hartford, Conn.
Apartments: $600,000
Russ Street Corp., 1026 Main St. (Owner builds)

Store and office: Est. $750,000
M. A. Connor Co., 561 Main St.

Cambridge, Mass.
Apartment: Est. $500,000
Chase & Gilbert, 250 Stuart St., Boston

Massachusetts
Paving: $222,215
M. McDonough, Humphrey St., Swampscott

New Haven, Conn.
Theatre: Est. $250,000
J. Alpert, 136 Sherman Ave.

Danbury, Conn.
Hospital and nurses' home: Est. $250,000
H. Wales Lines Co., 134 State St., Meriden

New Haven, Conn.
By-products plant: Est. $100,000
Koppers Erection Co., Waterfront St.

Newington, Conn.
Home: Est. $300,000
Dennis O'Brien & Sons, Inc., 118 Asylum St., Hartford

Somerville, Mass.
Apartment: $300,000
P. Salvi, 590 Main St., Cambridge. Separate contracts

Middletown, Conn.
Bank: Est. $350,000
Dennis O'Brien Co., 118 Asylum St., Hartford

Brockton, Mass.
Boiler plant: Est. $125,000
C. A. Batson Co., 26 Arlington St.

Middle Atlantic

New York, N. Y.
Office and store: $23,000,000 (Est.)
Dwight P. Robinson Co., 125 E. 46th St.

Warehouse and distributing center: Est. $2,500,000
White Constr. Co., Inc., 95 Madison Ave.

Office and printing: $6,000,000 (Est.)
Hegeman-Harris Co., 360 Madison Ave.

Bridge: $1,326,018 (unofficial)
P. T. Cox Contg. Co., 154 Nassau St., N. Y. C.

Long Island City, N. Y.
Subway: $5,393,766
Corson Constr. Co., 1440 Bway., N. Y. C.

Ithaca, N. Y.
Dormitory: Est. $1,500,000
Dall, Haydon & Treat, 70 East 45th St., New York

Brooklyn, N. Y.
Hotel: $3,500,000
Bing & Bing (separate contracts), 119 W. 40th St., New York

Jackson Heights, N. Y.
Apartment: $2,000,000
Cosmopolitan Enterprises Co. (separate contracts)
B. H. Whinston, 6 E. 46th St., N. Y. C. (archt.)

Binghamton, N. Y.
Hotel & garage: Est. $2,500,000
Thompson Starrett Co., 250 Park Ave., New York

Newark, N. J.
Exchange: Est. $1,500,000
Turner Constr. Co., 420 Lexington Ave., New York

Step-by-Step
Curing Concrete

"Water-Glass" solution, by sealing
of mixing water which acts
no sprinkling

1 SILICATE OF SODA, made by fusing white sand and soda ash, is a glass-like product that dissolves in water — hence its name "water glass." For curing concrete roads the Grasselli Chemical Company, of Cleveland, makes a special grade of this product which it ships to highway contractors in 55-gal. steel drums, each holding 610 lb. of chemical. The drums are placed on stands, as shown above, and fitted with a molasses spigot.

2 TO PREPARE THE SOLUTION for application to the concrete road surface it is diluted generally about 25 per cent—3 parts of silicate of soda to 1 part of water.

3 MIXING should be thorough. An ordinary barrel and a paddle or shovel are the only equipment needed.

4 DELIVERED IN PAILS at proper intervals along the green concrete paving slab, the solution of silicate of soda is ready for application. The chemical, it should be noted, is applied to the surface of the slab—not mixed with the concrete. One drum of silicate of soda will cover 305 lin. ft. of 18-ft. concrete highway.

5 ON THE CONCRETE SURFACE of the pavement the solution is poured from the buckets. Ordinarily it requires about 1 lb. of the undiluted silicate of soda solution per square yard of surface.

Field Methods

Roads Chemically

surface, retards evaporation
to hydrate cement—means
or covering

6 BROOMING the solution evenly over the surface of the concrete while it is still green is the next operation.

7 SPRINKLING from an ordinary watering pot, instead of pouring from pails, is recommended to produce even distribution on rough concrete base, as contrasted with the smoother top wearing surface.

8 ON CONCRETE BASE work, after the silicate of soda solution has been sprinkled on the surface, brooming is done in the same way as for top surface treatment.

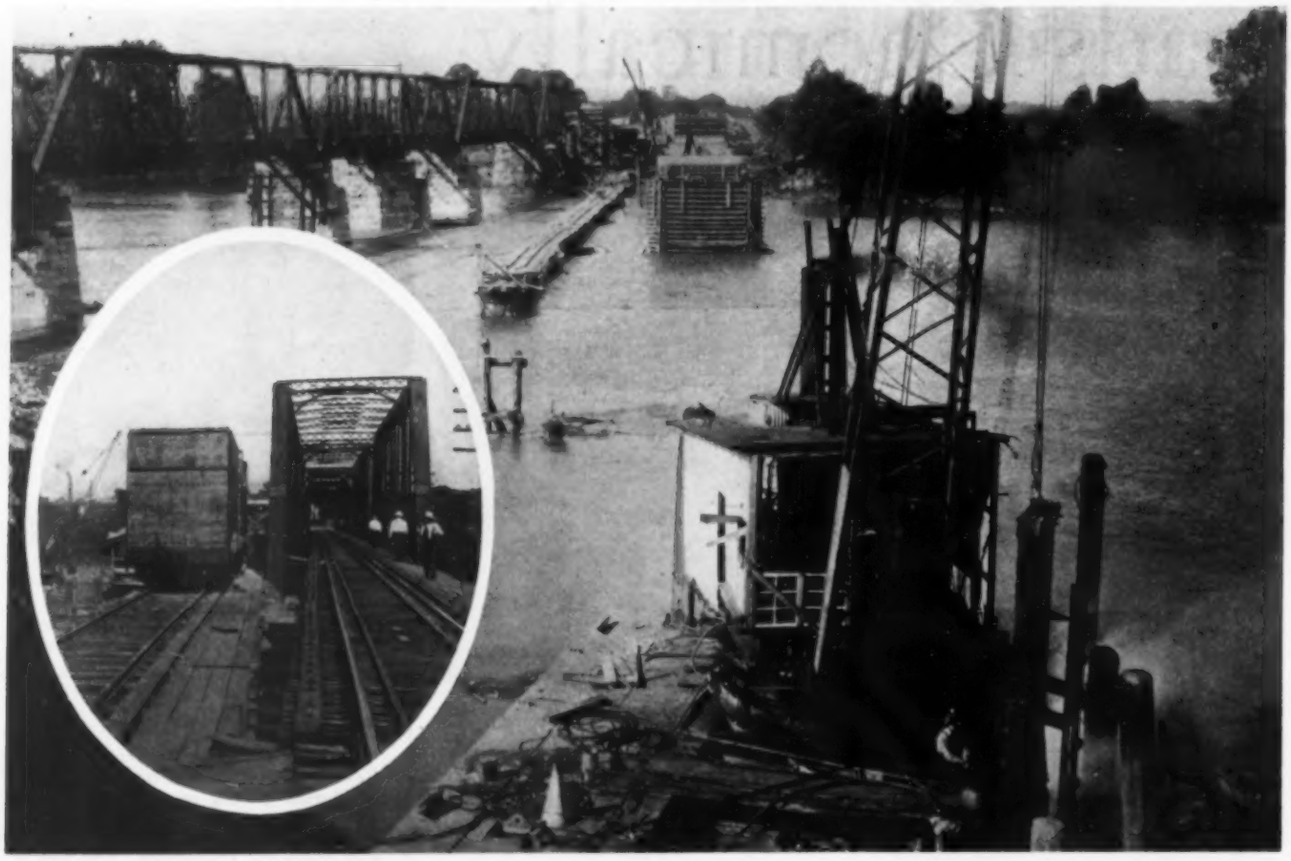
To Appear Soon

Vincent B. Smith, assistant editor of *Construction Methods*, has been down in Florida getting material for a picture story on an extraordinary road-building job—the Tamiami Trail highway across the Everglades. His article is scheduled for early publication.

9 EDGES of paving slabs are painted with a concentrated solution of silicate of soda, instead of banking with earth.

10 THE FINISHED SURFACE—in this case a Maryland road—is produced by the silicate of soda method of curing without resort to canvas covering, ponding, wetted earth or straw, or periodic sprinkling during the curing process. The chemical acts to seal the surface of the slab and prevent the evaporation of the original mixing water in the concrete which hydrates the cement.

A Couple of Bridge Pier "Kinks"



SECTIONAL STEEL HULLS for a derrick boat helped the Dravo Contracting Company, of Pittsburgh, build concrete piers for the Pennsylvania Railroad bridge over the Wabash River at Terre Haute, Ind. The hull consists of four 10x40-ft. floating steel caissons, designed for shipment to the job on railway flat cars, as shown in the oval insert above. A grillage of standard beams supports a Dravo whirler crane, shown driving concrete piles with false leads. The derrick boat has spuds for anchorage in flowing water. All parts may be easily shipped by rail to any inland point.

A MATERIAL TRESTLE of pile bents and steel I-beams proved a great convenience on the same job. H. L. Hood of the Dravo Contracting Company reports that it withstood many severe tests from construction use, as well as from floods. Spans of 58 ft. were used to prevent collection of drift.

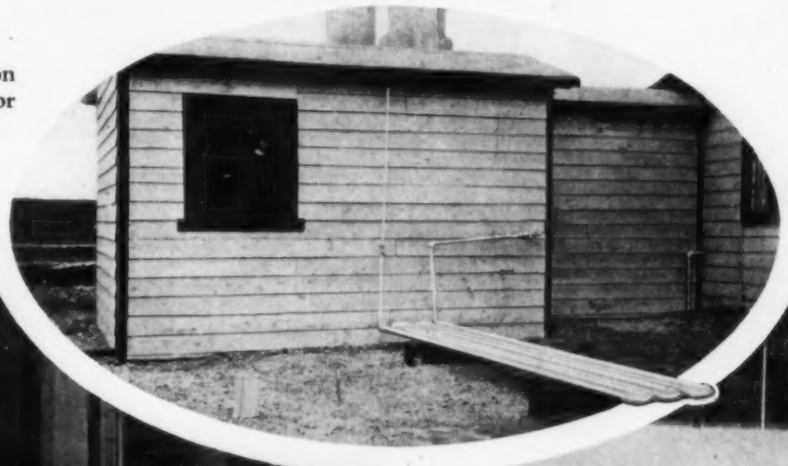
ROLLER, "inked" from a pan of white lead, proves a simple and effective method of brightening up the lettering on these street signs.

JOB ODDITIES

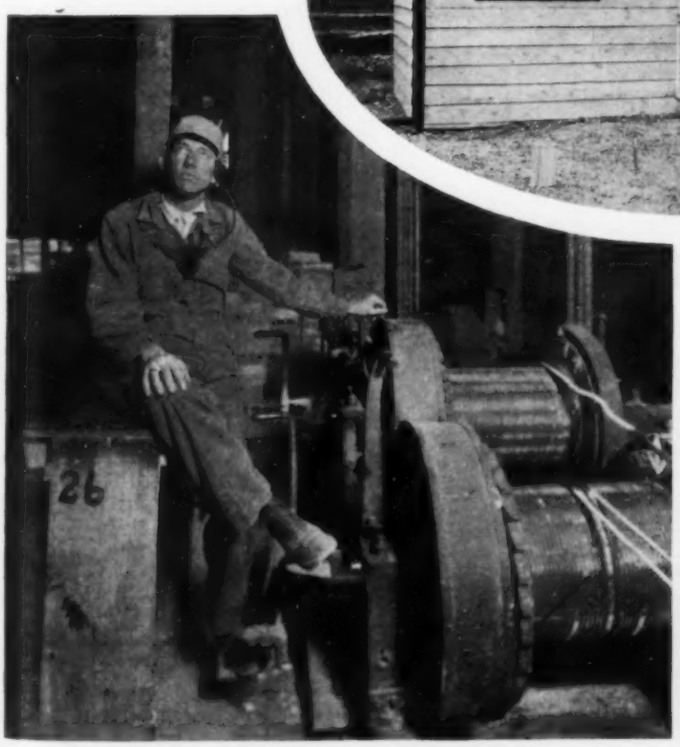
A Monthly Page of Unusual Features of Construction

STALAGMITES? NO—just an incrustation of ice on the wickets of a Chanoine type movable dam on the Ohio River, as caught by the camera of Marshall Gray, U. S. Engineer Office, Louisville, Ky.

If there's anything odd on *your* work, mail the Editor a snapshot of it.



A SOLAR SHOWER BATH! R. S. Moore and other engineers of the New York Port Authority rigged up this pipe manifold to utilize the sun's heat for warming water for the wash room on the Howland Hook bridge job.



HEAD PHONE SET, instead of bells or arm signals, carried orders to this hoist operator on the construction of the Maccabees Temple in Detroit, an H. G. Christman Company job.

TEARING THINGS UP on University of California's gridiron. Football Captain Phillips and Captain-elect Coltrin forsake pigskin for Caterpillar tractor and subsoiler in reconditioning field.

NEW EQUIPMENT ON THE JOB

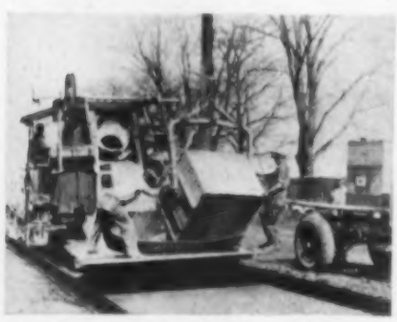
A New 15½-Lb. Electric Hammer

An electric hammer which strikes 2,300 blows a minute, whereas the average workman with a sledge strikes but 50 or 60 blows, has been placed on the market by Black & Decker Mfg. Co., Towson Heights, Md. This company's records show that the hammer cut a stairwell 3x10 ft. in a 12-in.

reinforced concrete floor in 8 hours. Another performance was 1,300 holes for theater seat expansion bolts $\frac{9}{16}$x2½ in., in 18 hours. The new hammer weighs 15½ lb. The hammer may be plugged in to any electric light socket.

Batch Box Mounted on Adjustable Trunnions

A new batch car and batch box for road work is one of the recent products



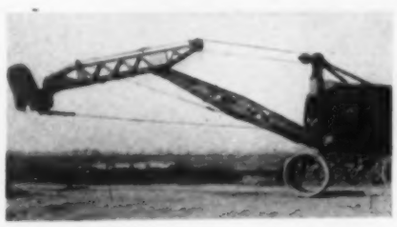
of the Lakewood Engineering Co. of Cleveland. The car is designed to handle two 48-cu.ft. batch boxes. The frame is of 6-in. ship channel, strongly braced and reinforced.

The batch box has adjustable trunnions, making it possible to alter the tipping axis to allow for variations in sizes of batches on different jobs. Another feature is the use of a chain in the bottom of the cement compartment which helps clean the cement from the compartment when the box is dumped.

In addition to the 48-cu.ft. size, the batch box is built in models of 41 and 45-cu.ft. capacities.

Drag Shovel Attachment for Excavating Machines

A new attachment for excavating machines, called a drag shovel, has been perfected by the Page Engineering Co. of Chicago. It combines the Page scraper bucket with a boom consisting of two parts—the boom proper and the dipper stick. The bucket is hinged on the end of the dipper stick; only two drums are required to operate the



bucket—one to pull the bucket, and the other to raise or lower the boom. The drag shovel can be installed on any dragline or pull-shovel excavator.

In operation, the weight of the boom on the bucket, it is claimed, increases digging ability, with cutting action like that of a dragline bucket for full length of stroke. The bucket can be picked up as soon as loaded. The hinged feature of the bucket and the load line leading directly to the drum—not through the boom—make for lighter boom construction.

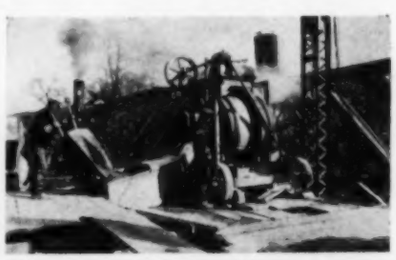
No Lame Backs With This New Tie Tamper

Two tamping teams at work with the new CP tie tampers now being marketed by the Chicago Pneumatic Tool Co. of New York are shown below. This tamper weighs 24½ lb. and strikes 3,000 blows per minute. The handle is so placed that both hands are on the same plane, permitting the operator to

work with his back straight and consequently with less fatigue. Complete control is under the palm of one hand.

A New "Three-Bagger" in the Mixer Field

The Ransome Concrete Machinery Co., of Dunellen, N. J., has added to its line a 14-S standard building mixer capable of handling a three-bag batch.



The drum is 57x42 in., with large-radius corners. Feed and discharge openings are 22 in. The power loader takes a full load without crowding and goes up in 7 sec.

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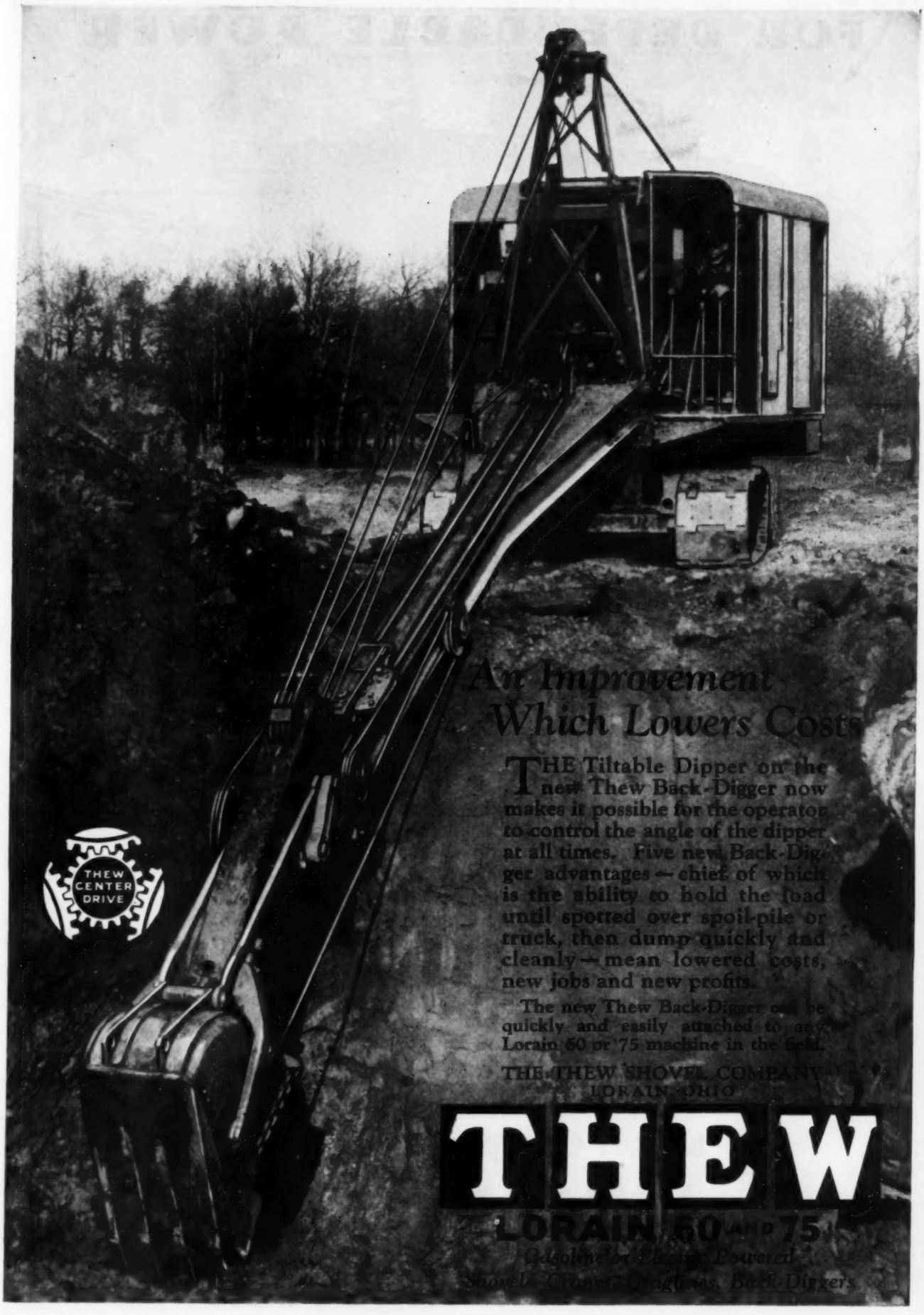
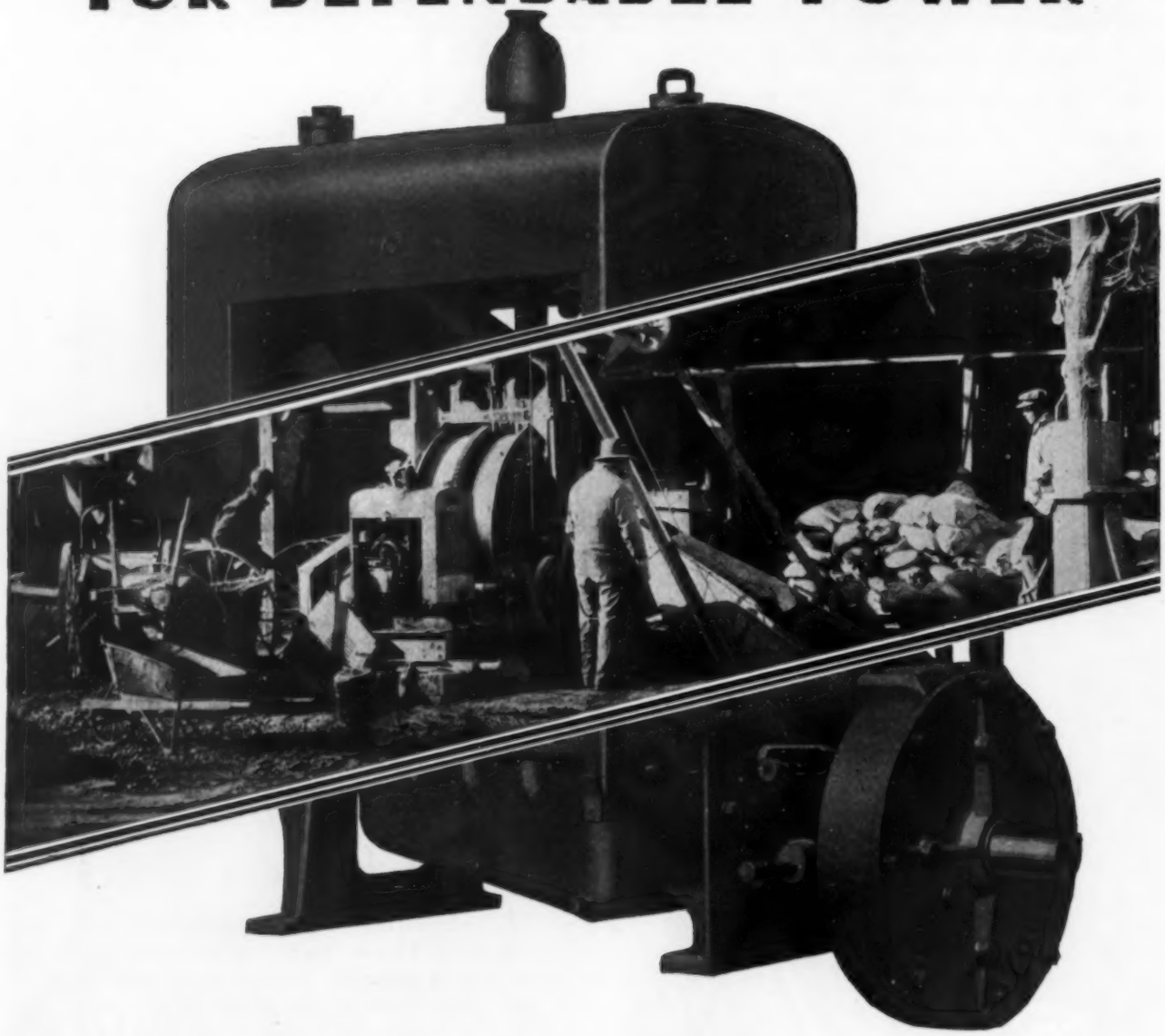

An Improvement
Which Lowers Costs
THE Tiltable Dipper on the new Thew Back-Digger now makes it possible for the operator to control the angle of the dipper at all times. Five new Back-Digger advantages — chief of which is the ability to hold the load until spotted over spoil-pile or truck, then dump quickly and cleanly — mean lowered costs, new jobs and new profits.
The new Thew Back-Digger can be quickly and easily attached to any Lorain 60 or 75 machine in the field.
THE THEW SHOVEL COMPANY
LORAIN, OHIO
THEW CENTER DRIVE
THEW
LORAIN 60 AND 75
Gasoline or Electric Powered
Shovels · Cranes · Draglines · Back-Diggers

FOR DEPENDABLE POWER



CONSISTENT—dependable power. After all, that's the sum and substance of the Le Roi. Its performance is unquestioned. Consequently, it has won national favor.

Besides being a reliable power unit of "liberal" rating—the Le Roi Engine costs less to operate per day and per year.

Le Roi is an engine of unusual merit—of extraordinary ability. Look to it for dependable power.

Le Roi Company, *Milwaukee*

LE ROI ENGINES

3 *to* 160 HORSE POWER

Still flying the "Broom!"

"Howdy, Colonel!"

"Why hello, Jim! Remember the time you had that BUCYRUS on her side at Dump Six?"—

So begins an article by Edgar Young on the life and work of the late General George W. Goethals, in a recent issue of the New York Herald Tribune.

Fresh is the memory of "the Colonel" in the minds of the thousands of men who toiled with him in building the Canal, and as they think of the wonderful work done by General Goethals and his able assistants, they also recall—as he did—the reliable BUCYRUS machines that saw the job through in the face of innumerable vicissitudes.

Old-timers who worked on the Panama Canal can well remember "The Broom," the emblem that waved proudly from the boom of the shovel holding the output record.

And they can remember, too, how this emblem of victory was carried—from start to finish—by the BUCYRUS machines on the big cut. BUCYRUS won that coveted marker with the highest records for daily, weekly and monthly output.

And today, BUCYRUS-ERIES are still proving true to their proud parentage—are still "*flying the broom*" on the world's major construction jobs.

On big railroad projects such as the Canton-Bayard cut-off—where BUCYRUS-ERIES held the output records from start to finish. On the construction of the New Hocking Valley line where more than 60 shovels worked, and again BUCYRUS-ERIES were the yardage leaders from start to finish. On the iron ranges, in quarries and coal fields, and on contracting jobs of every size—BUCYRUS-ERIES are "flying the broom."

Having more power to do *harder* work, and do it faster, BUCYRUS-ERIE machines are built with the rugged simplicity that enables them to stand up to the faster pace they set. And as a result, are as widely noted for *Reliability* as for Output.

A Union of Strength

"BUCYRUS" and "ERIE"—each the most successful manufacturer in its particular field—consolidated Jan. 1, 1928. The unmatched resources of BUCYRUS-ERIE assure the buyer of Unequalled Value, More Efficient Machines, Permanence of the Manufacturer, and a More Complete Field Service.

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BUCYRUS-ERIE COMPANY

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Over two years ago the Foote Company announced a new trend in paver design and construction—Timken Anti-Friction bearings.

Today Anti-Friction bearings have been incorporated in the construction of every paver on the market!

—but Foote led the way!

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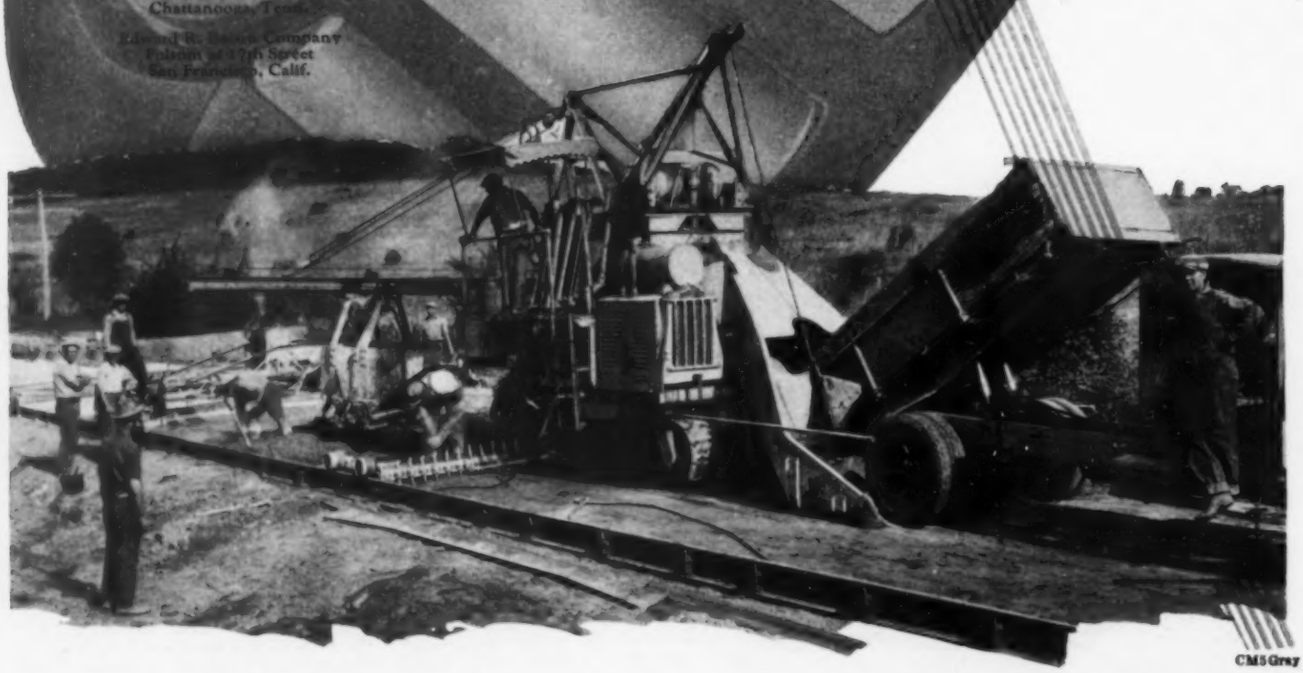
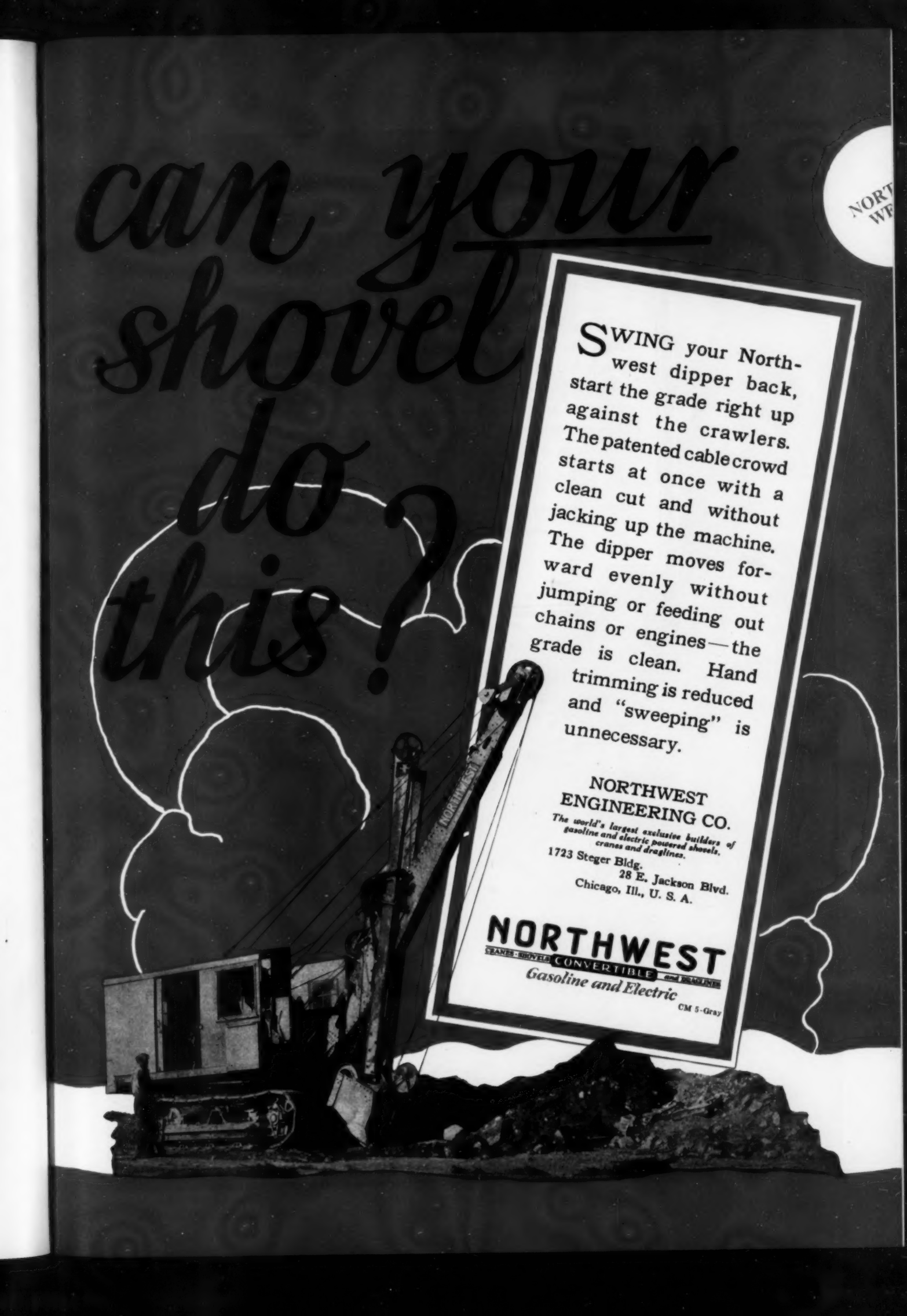


CM5 Gray


can your shovel do this?
SWING your Northwest dipper back, start the grade right up against the crawlers. The patented cable crowd starts at once with a clean cut and without jacking up the machine. The dipper moves forward evenly without jumping or feeding out chains or engines—the grade is clean. Hand trimming is reduced and "sweeping" is unnecessary.
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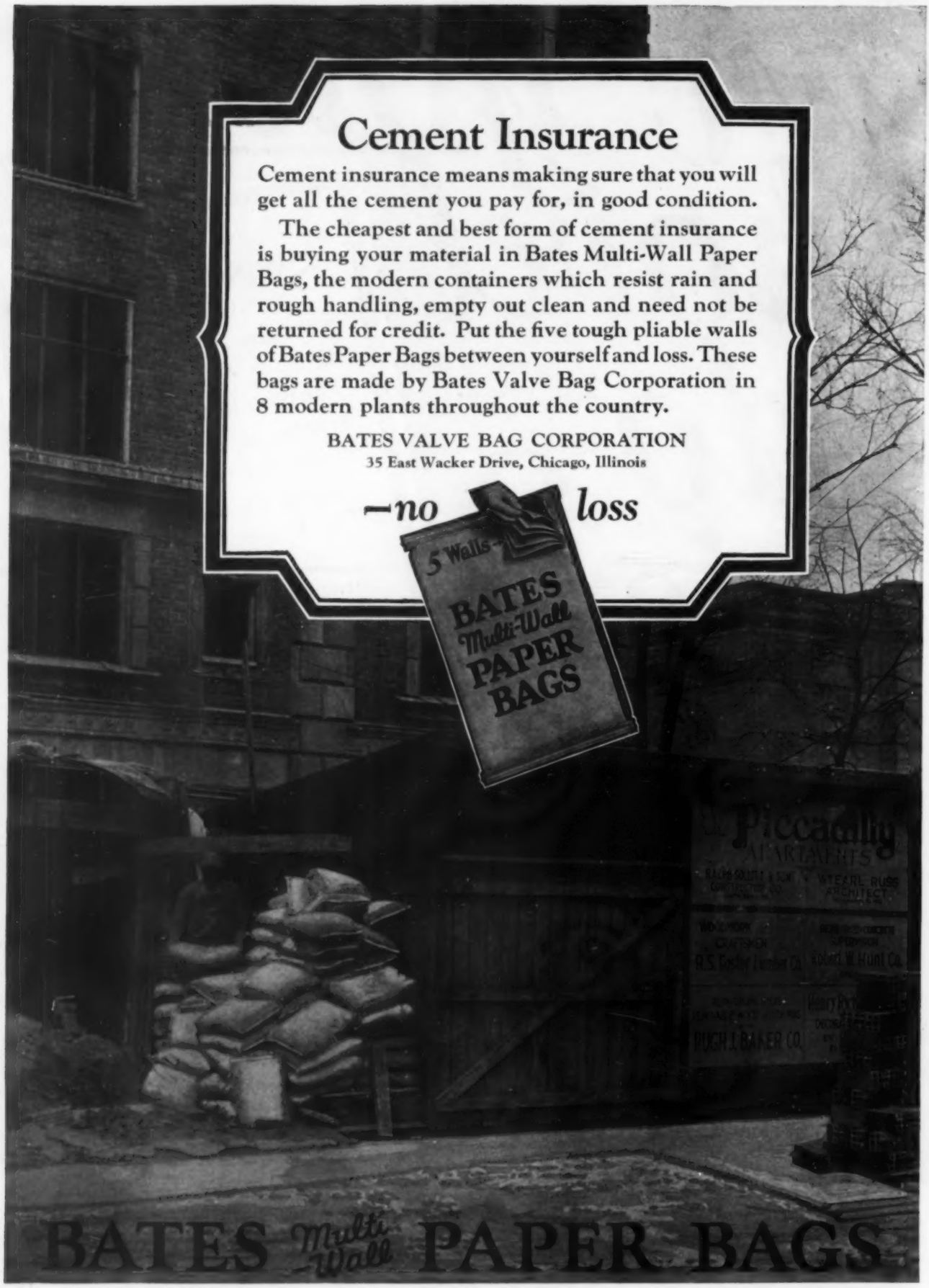
NORTHWEST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Cement insurance means making sure that you will get all the cement you pay for, in good condition.
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5 Walls
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The cement and plaster used in the construction of the Piccadilly Apartment house, Indianapolis, were bought in Bates Multi-Wall Paper Bags by the contractors, Ralph Sollitt & Sons.

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After all is said—results are what count, and it is on this basis that "HERCULES" (Red-Strand) Wire rope continues to make and hold friends. Its strength and endurance provide safe, dependable and economical service.

Your inquiries would be appreciated

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Turner has over 150 Carbic Lights in service

EVER since carbic light was first produced, about 14 years ago, the Turner Construction Co. has depended upon it for all sorts of night construction work on many building operations. They find it particularly useful when finishing concrete floors at night. Recently all the floors of the new Uppercu Cadillac building in New York City were finished at night with the help of carbic light.

Turner also uses carbic light for excavation and foundation work and for night work in inaccessible places.

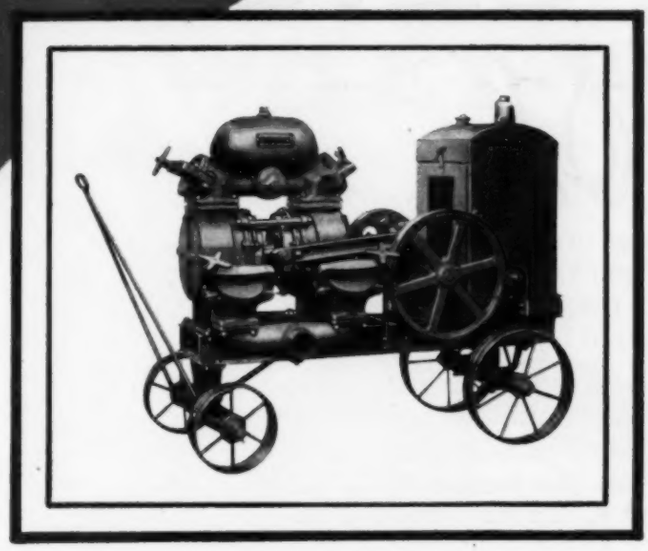
Thousands of Carbic Lights are in use today. Your jobber can supply you.

Style No. 2

CARBIC LIGHT

OXWELD ACETYLENE COMPANY
Unit of Union Carbide and Carbon Corporation
New York City, 30 East 42d Street — UCC — Chicago, Peoples Gas Bldg.
San Francisco, 8th and Brannan Streets

Carbic is distributed by the Union Carbide Sales Company through its national chain of warehouses and is sold by jobbers everywhere.



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960 EDT No. 4

Humphryes Lift and Force Trench Pump in the double four inch size. Capacity, 200 gallons per minute. Suction Lift, 25 feet. Maximum discharge head, 30 feet. Designed to handle large quantities of solid matter without clogging. An ideal pump for well point drainage systems.

Measure Your Pump's Efficiency in *gallons* per *day*

GALLONS per minute or gallons per hour do not count for much when you are trying to keep an excavation dry enough to work in. Any pump will deliver its rated capacity for one minute.

It's the performance hour after hour that counts. Performance without delays for repairs, without time out while crews stand idle and costs increase.

Humphryes reputation for more gallons per day is a thing contractors talk about. Humphryes pumps are built to stand up under heavy loads and continuous work.

Write today for complete information and description of Humphryes Contractors' Pumps

THE HUMPHRYES MANUFACTURING COMPANY
Established 1882
MANSFIELD, OHIO

HUMPHRYES
CONTRACTORS' PUMPS

Hercules

O.K.

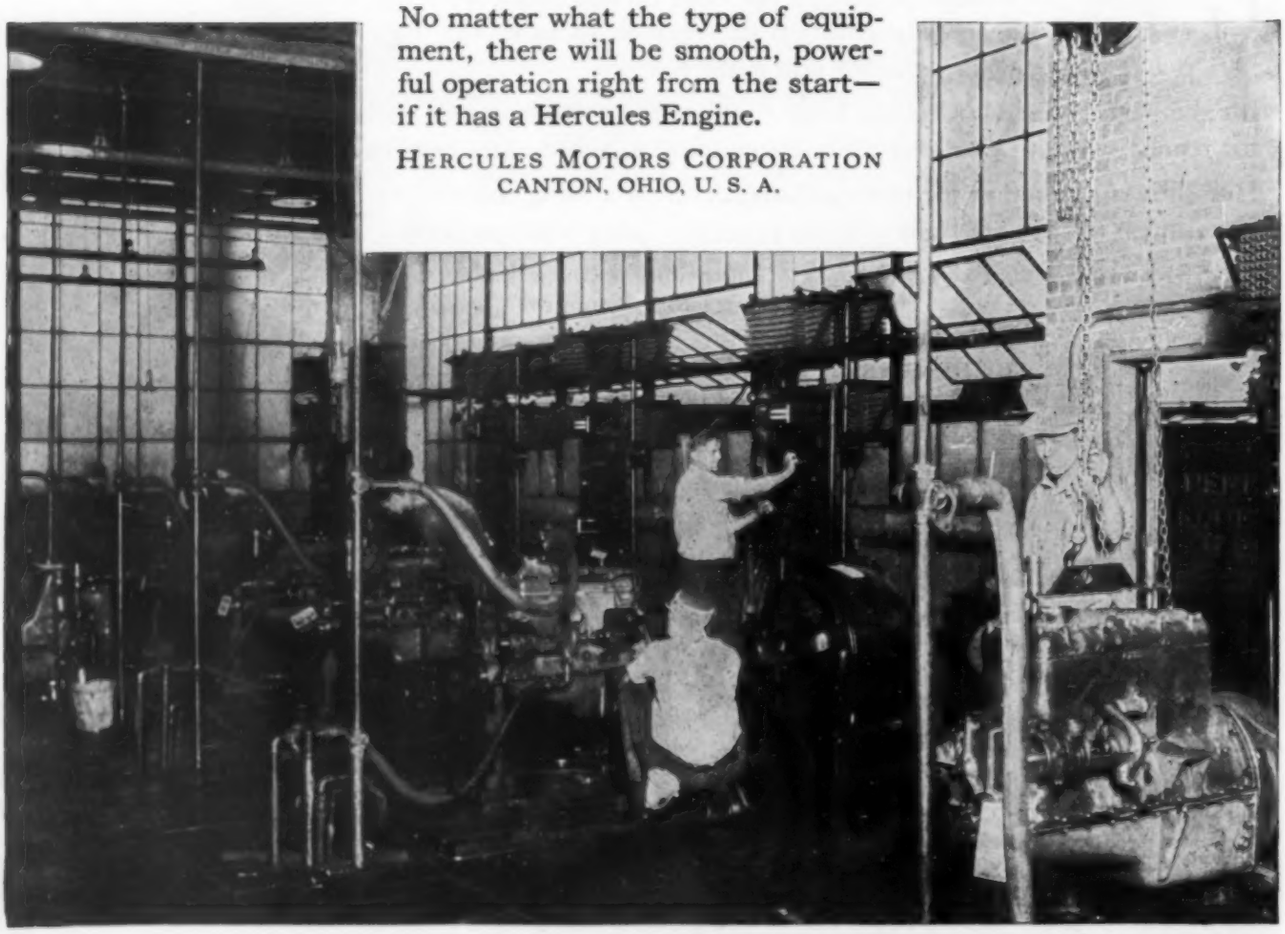
It is a badge of merit—this Hercules O.K. It is given only to an engine that has shown the exceptional performance required in the Hercules tests.

Every Hercules Engine gets these tests. The dynamometer unfailingly records the individual ability of each Engine. So, the engine with the Hercules O.K. is ready to do a full day's work at full capacity. It will keep up this profitable work for long periods with only ordinary care.

Farmers, road builders, general contractors and commercial transportation men know the long-lived economy of Hercules Engines.

No matter what the type of equipment, there will be smooth, powerful operation right from the start—if it has a Hercules Engine.

HERCULES MOTORS CORPORATION
CANTON, OHIO, U. S. A.



U. G. I. Owns ~~Ten~~ 16
WILEY-WHIRLEYS

They Must Be Good

A Story In Pictures

In 1925 the U. G. I. Contracting Company placed these two Model 60 Wiley-Whirleys on their Lock and Dam work at Newburgh, Ind. The next photograph shows what they did two years later.

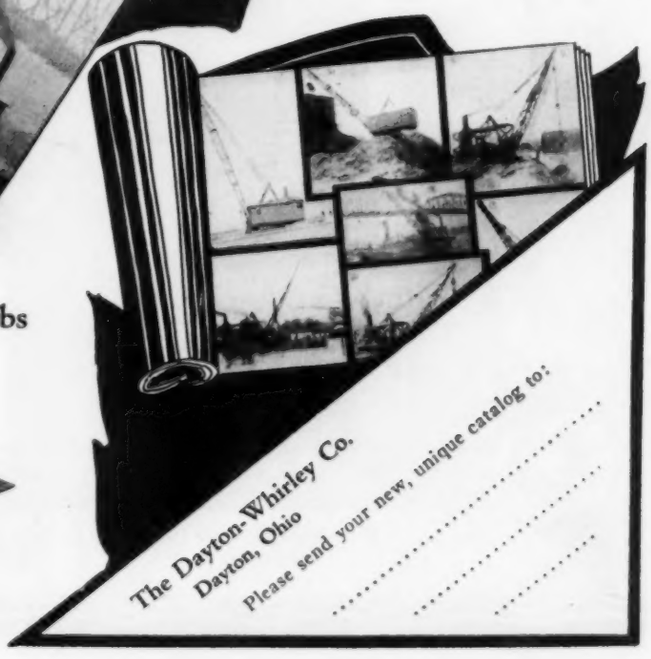
Recently placed an order for Six more Whirleys for their job at Tidioute

This Model 75 Wiley-Whirley was mounted on a 26x100-ft. barge for U. G. I.'s C. & O. Bridge job at Cincinnati. Three months after the 7 Wiley-Whirleys at Sewickley had proved worthy.

This photograph was taken shortly after work started on the Govt. Lock and Dam at Dead Mans Island near Sewickley, Pa.

The purchase of these 7 Model 75 Wiley-Whirleys in 1927 was based on the performance of the two Model 60's at Newburgh, Ind.

The next picture shows what U. G. I. did three months later.



An unusual machine on many unusual jobs on view in our Catalog.

Mail the coupon today

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Dayton, Ohio
Please send your new, unique catalog to:
.....
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THE DAYTON-WHIRLEY CO.
DAYTON, OHIO
U. S. A.

Ransome

Operation of Hor

EN charging the tank with concrete the conveyo
n a turn or two once or twice during the charg
ete forward away from the door. This is done t
handle of the reversing switch "A" for a secon
ton starter the forward button is pressed to start a
stop.

closing the door see that all concrete is below t
slides. Keep the top of the door clean or it will
t with the gasket. The door is closed and opened
way valve "B". After closing the door first oper
"C" by lever "D" then start conveyor turning
into discharge line. While this is being done the operator
atch the air gauge "E" and when it drops rapidly to "C" the
s been discharged and the motor should be stopped and the
closed. Then the door is opened by means of valve "B" ready
ext batch.

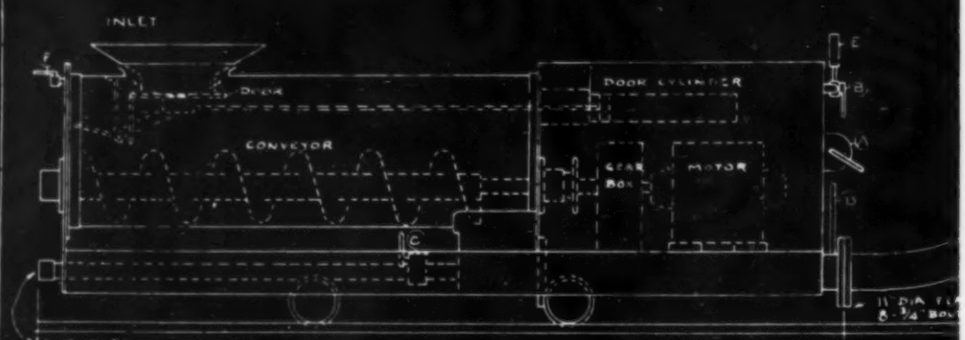
te should not be placed if the air gauge shows less than 80
the course of a shot the gauge should start rising it would

Ransome Paver and Pneumatic Placer on the New York Subway Job.

Lehigh Valley Railroad, Musconetcong Tunnel, N. J.

As soon as the last charge has been p
conveyor runni
Then close the
greased and the
ould run horiz
but never downward from the placer.

* IMPORTANT—Do not use coarse



Chesapeake & Ohio Tunnel, Covington, Va.

A very large increase in the number of construction jobs on which pneumatic concrete placers are used is evidence of the continually growing confidence in Ransome.

PNEUMATIC PLACERS

CONFIDE

Placer

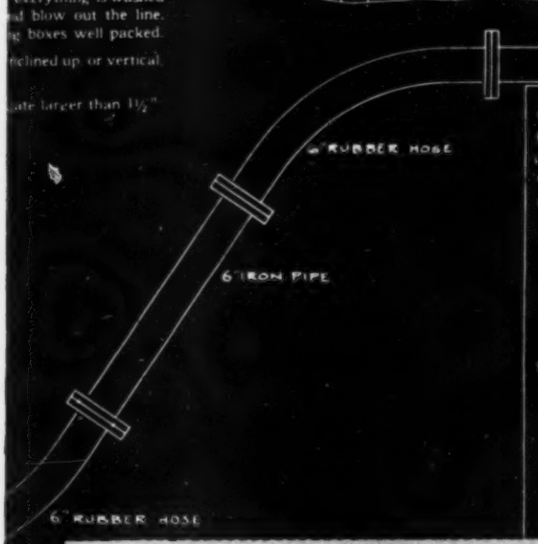
ild be stopped, the air
ase the pressure in the
n the pipe. Sometimes
with another shot of
e pipe taken apart. A
beyond the end of the

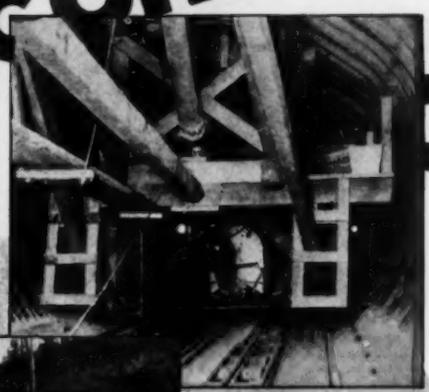
r and stall the motor,
clear it. Then start
placing.

he machine should be
everything is washed
d blow out the line.
g boxes well packed.

clined up or vertical.

ate larger than 1½"





14 Ft. Circular Water Tunnel 12,700 ft. long for Washington Water Power Company, Chelan, Washington.

Aluminum Company of America Water Power Tunnel, Calderwood, Tenn.

RANSOME

CONFIDENCE

If you have a tunnel to line, or any similar work, give us the answers to the questions below:

1. Length of Tunnel, end to end.
2. Length between shafts.
3. Height and width in rough.
4. Height and width, finished section.
5. Minimum thickness of concrete and point at which it it is found.
6. Amount and location of reinforcing.
7. Is tunnel in rock or earth?
8. Will tunnel excavation be completed before lining?
9. If mucking, while lining, must muck cars pass through forms?
10. If in soft ground, will concreting follow up behind heading?

Estimated Distances.

11. Length of form used, steel or wood, and print of same.
12. Type of concrete cars. Height and width.
13. Locomotive (if used) weight and width.
14. Size and kind of grade rail used.
15. Compressed air available in cubic feet per minute.
16. Will drills, air hammers, etc., operate from this supply when blowing
17. Gauge and size of track used?
18. Electric current available for operating motor.
19. How much yardage to be placed by air is involved?
20. Make sketch showing measurements mentioned in 3, 4, 5 and

MAIL THIS COUPON TODAY

Name of Contractor or Engineer .....

Address .....

Location of Job .....

CONFIDENCE

Machinery Company

1878 — Years — 1928

Dunellen New Jersey

CONFIDENCE

A stretch of concrete roadway between Nashville and Murfreesboro, Tennessee, lastingly protected by Carey Elastite Expansion Joint, properly installed at intervals of forty feet.

No $HOCK-ABSORBERS *needed here!*

...the road is *wrinkle-proofed*

Carey Elastite Expansion Joint consists of a heavy body of fibrous asphaltic compound sandwiched, by heavy mechanical pressure, between two layers of asphalt-saturated felt. As easily handled as a board, even in the longest lengths.

LOOKS as smooth as a bowling-alley, doesn't it, this beautiful stretch of concrete road? Not a sign of a bump or a crack.

And it will stay smooth. Winter weather may do its worst, summer sun may scorch and sear—the concrete cannot crack or spall. That's because it is guarded—lastingly protected against expansion and contraction stresses—by Carey Elastite Expansion Joint, one hundred and thirty-two joints to the mile.

Carey Elastite Expansion Joint is made of the best and most carefully selected materials. It is the product of a solid, substantial company which has been in business for more than half a century. In every State in the Union, Carey Elastite Expansion Joint has a record of long years of satisfactory service. Its use is increasing at an enormous rate. It passes any expansion joint specifications, anywhere. Write for particulars about modern methods of expansion joint installation.

Carey Elastite

EXPANSION JOINT

THE PHILIP CAREY COMPANY
Lockland, Cincinnati, Ohio

THE AUSTIN-WESTERN LINE

BLADE GRADERS

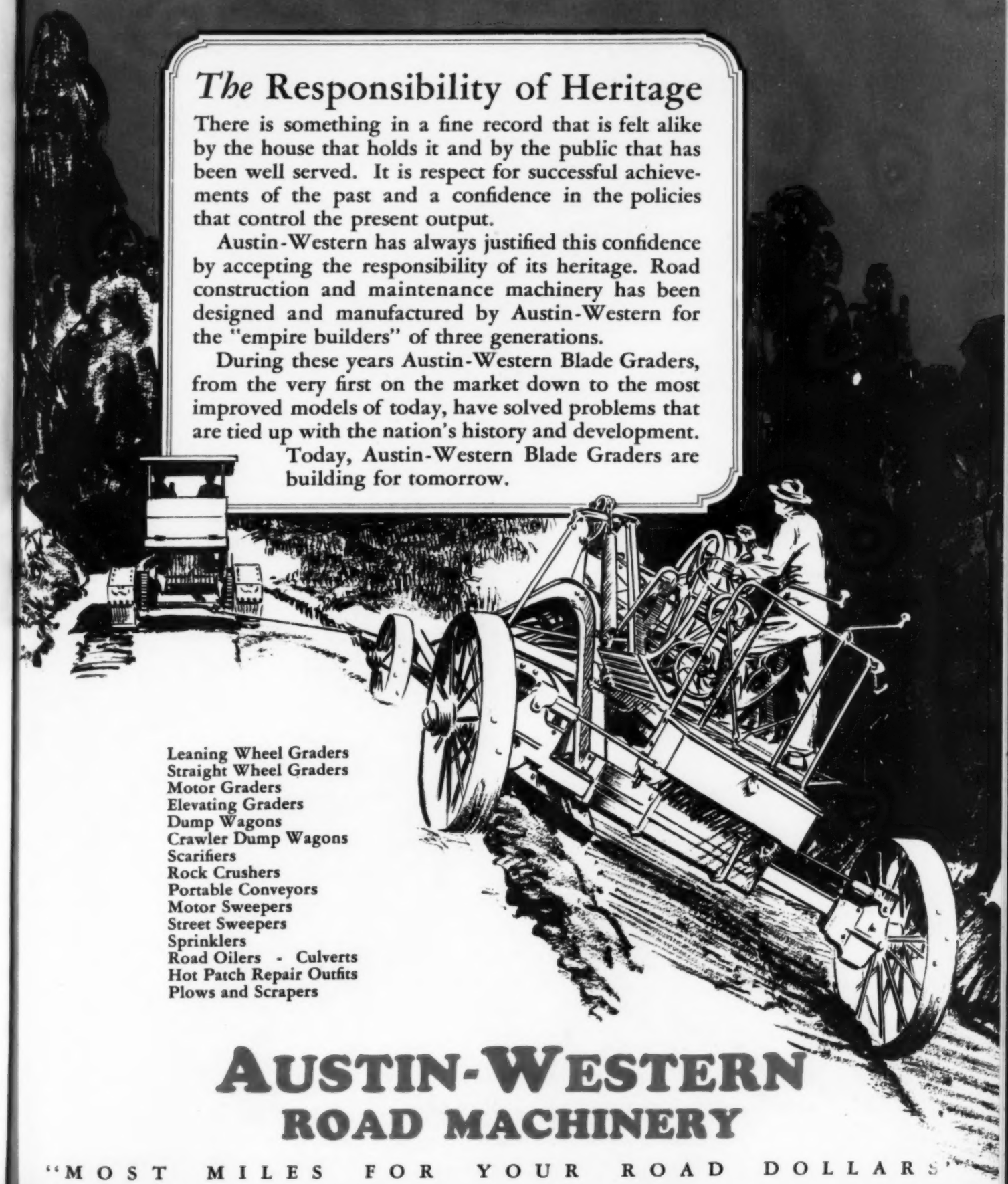
The Responsibility of Heritage

There is something in a fine record that is felt alike by the house that holds it and by the public that has been well served. It is respect for successful achievements of the past and a confidence in the policies that control the present output.

Austin-Western has always justified this confidence by accepting the responsibility of its heritage. Road construction and maintenance machinery has been designed and manufactured by Austin-Western for the "empire builders" of three generations.

During these years Austin-Western Blade Graders, from the very first on the market down to the most improved models of today, have solved problems that are tied up with the nation's history and development.

Today, Austin-Western Blade Graders are building for tomorrow.



Leaning Wheel Graders
Straight Wheel Graders
Motor Graders
Elevating Graders
Dump Wagons
Crawler Dump Wagons
Scarifiers
Rock Crushers
Portable Conveyors
Motor Sweepers
Street Sweepers
Sprinklers
Road Oilers - Culverts
Hot Patch Repair Outfits
Plows and Scrapers

AUSTIN-WESTERN
ROAD MACHINERY

"MOST MILES FOR YOUR ROAD DOLLARS"

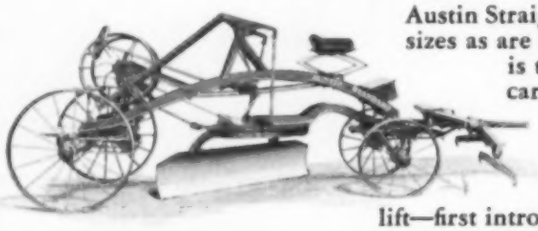
More miles per day—week—or year *with* AUSTIN-WESTERN Blade Graders

Austin Leaning Wheel Graders

Austin Leaning Wheel Graders are made in four sizes, ranging from the 3200-lb. "Standard" with its 7-foot blade, to the 9300-lb. "Mammoth Senior"—illustrated at the right—with its 12-foot blade. Then there are the Junior and Senior "Rip-Snorters"—combination Grader—Scarifiers—which are invaluable on reconstruction work.

All Austin Leaning Wheel Graders and Rip-Snorters are equipped with telescopic type rear axles which permit the operator to work his machine with either the longest or the shortest rear axle on any Leaning Wheel Grader, or any desired length between the two extremes. While but one of many exclusive Austin features, the telescopic axle is alone enough to account for the fact that any Austin Leaning Wheel Grader will do more and better work and more kinds of work than any other Leaning Wheel Grader of its class.

Austin Straight Wheel Graders



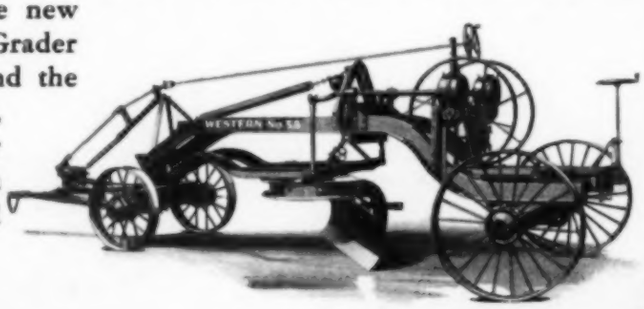
Austin Straight Wheel Graders and Rip-Snorters are made in the same sizes as are the Leaning Wheel models. The "Standard" shown below is the lightest Straight Wheel model, weighing 2500-lbs. and carrying a 7-foot blade.

The Straight Wheel "Standard" is the original of the famous Austin Grader line, and was the world's first steel frame road grader, having been on the market for nearly fifty years. The arched frame, and rack and pinion blade lift—first introduced on the Straight Wheel "Standard"—are still two of the best and most popular features of all Austin machines.

Western Graders—*A size and style for every job*

The Western Grader Line is unusually complete, including as it does models ranging in weight from the 1200-lb. Patrol Grader No. 12 to the 11,500-lb. Grader No. 20.

Among the most interesting developments for 1928 are the new 5500-lb. Western Grader No. 55, a heavy duty 8-foot model; the new 2200-lb. Western Leaning Wheel Patrol Grader No. 22, with its telescopic rear axle; and the 1200-lb. Western Patrol Grader No. 12, which has all the features responsible for the outstanding success of the Western Patrol Grader No. 1—the original "Patrol Grader With Lost Motion Left Out."



The Austin-Western Road Machinery Co.
Dept. 1405 400 North Michigan Ave., Chicago, U. S. A.

☐ Motor Graders ☐ Road Graders ☐ Snow Plows
☐ Rollers ☐ Scarifiers ☐ Rock Crushers
☐ Portable Conveyors ☐ Elevating Graders
☐ Dump Wagons ☐ Street Sweepers ☐ Sprinklers ☐ Oilers
☐ Hot-Patch Repair Outfits ☐ Plows and Scrapers

Please send literature and full information on items checked.

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Address .....

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The Austin-Western Road Machinery Co.
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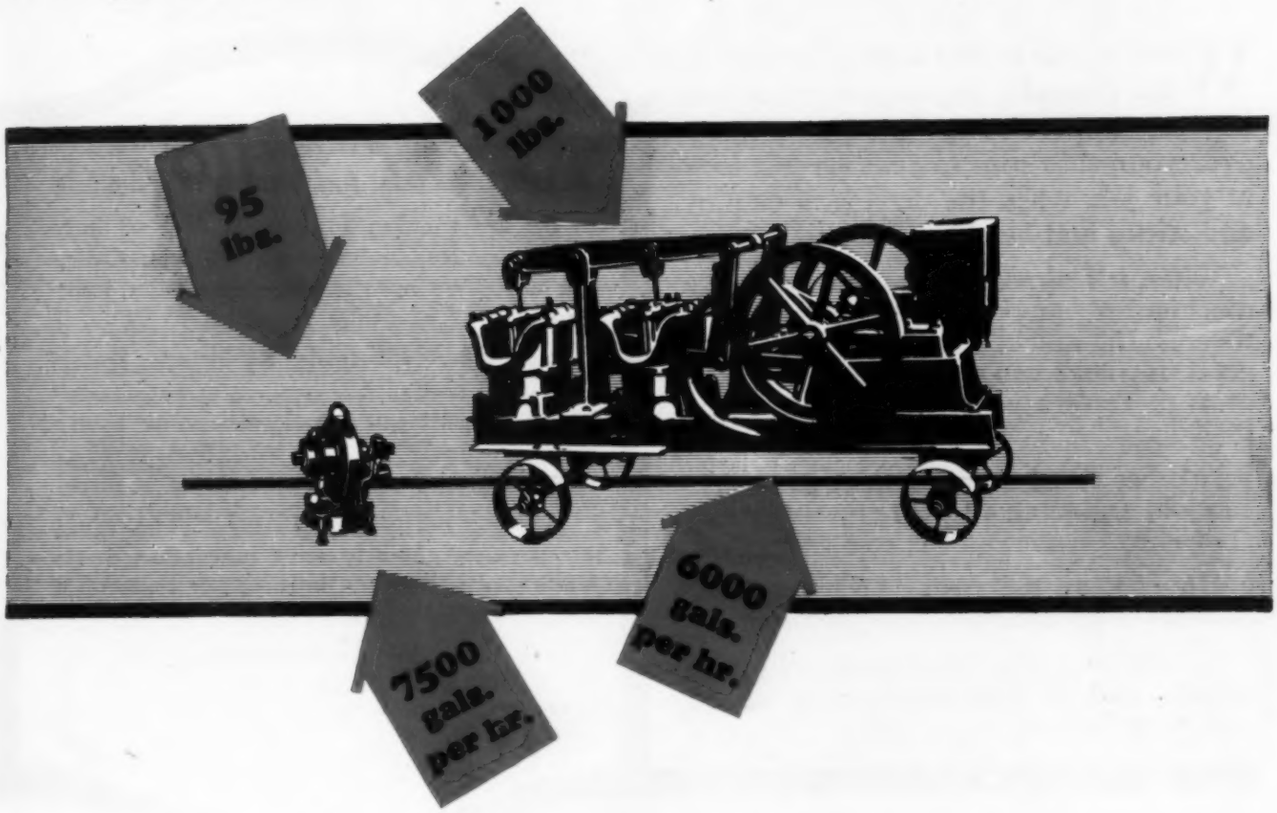
what do you mean Portability?



what do you mean Capacity?

$225
f. o. b. factory

an' not only that-- The Homelite Portable Centrifugal Pump will stand rough construction service in spite of its light weight. Dependability . . . thousands of these 1½ H.P. air cooled Homelite engines on pumps and generators are working all over the world—some for more than eight years. Suction lift . . . up to 20 ft. Head . . . up to 50 ft. Economy . . . 4 to 5 hours per gal. of gasoline. Mud and grit . . . O. K. to 35% of solids, heavy oils, gasoline—anything that passes the foot-valve strainer. Think of the time saved in moving Homelite—a man can carry it. And the labor saved! And the convenience! Fuel is in the base; waterproof Robert Bosch magneto insures fat, sure spark. Bronze impeller. Oversize ball bearings. Every detail right. Spring feet absorb vibration—no skids required. By all means get the details—ask us to arrange demonstration.

THE HOMELITE CORPORATION
PORT CHESTER, N. Y.

Homelite
Portable Centrifugal Pump

Distributors in principal cities throughout the world

2515

INSLEY

SHOVEL — Ditcher — Skimmer — Dragline — CRANE

WHEN you have a ticklish job, when the ground is impassable, when you have to wade through mud and water over your shoe tops to even have a look at your job, when the digging is gummy and sticky and hard to handle—

When it's almost impossible to find a machine of any sort that can travel through the muck, let alone dig after you get it in where you want it, and when it's even more of a problem to get fuel into it—

In other words, when you've got a ticklish job, and have a chance to either lose your shirt or make some real money—

Investigate the Insley Excavator; and your troubles will be over.

Its low first cost, compared to its high quality, and its general all round utility, will surprise you.

Building
A Dike With An Insley Dragline

We are running 24 hours daily, we have three operators and average 300 feet of dike per day. We have three miles of dike built, and have ¾ of a mile yet to go.

We are surely well pleased with the Insley. We have surely had good luck, but I don't give the luck credit for all, because we have a good machine. We have worked in water all the time.

If anyone tells you the Insley can't be turned on mats tell them to come here and we will show them. We turn on three 5-ft. mats 16 ft. long and quickly, too.

COX BROTHERS,
H. O. Cox.

Merrill, Oregon
Dec. 4, 1927.

DITCHER

SKIMMER

SHOVEL

CRANE

611

INSLEY MANUFACTURING COMPANY - Indianapolis

Engineers and Manufacturers

Roebling

"Blue Center" Steel Wire Rope

A Big Job!

BUILDING	New York Central Railroad Office Building
LOCATION	Park Avenue, New York City
CONTRACTORS	McClintic-Marshall Company
STEEL REQUIRED	Approximately 27,000 tons
HEIGHT	Thirty-eight stories above the street
SIZE	Covers an entire city block
HOISTING EQUIPMENT	Eight huge guy derricks
WIRE ROPE USED	Roebling "Blue Center" Steel
WEIGHT OF STEEL COLUMNS,	Various, but up to 51 tons each

For a safe and dependable wire rope, use Roebling "Blue Center", made in constructions to meet your requirements

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY

. . Why the INCREASING CONFIDENCE in "GENERAL" EQUIPMENT ?

THE knowledge that the General guarantee means just what it says has gone far to build the confidence of users and distributors in General Contractors' Equipment.

Every General product must deliver complete satisfaction according to *your* expectations and standards. Every General distributor is authorized and instructed to follow each sale through to complete satisfaction.

The manufacturer who issues so bold a guarantee must first have made sure that his product will "stand" the guarantee. And this sincerity on General's part has always been met by good sportsmanship on the contractor's side, which has been largely responsible for the increasing confidence between the two.

The New General Concrete Buggy is so guaranteed. It is the strongest cart we have ever made. See it—put it to the test today.

Mail the coupon for a folder fully describing the New General Concrete Buggy.

GENERAL WHEELBARROW COMPANY

Headquarters for Wheelbarrows, Concrete Carts, Steel Mortar Boxes, Scrapers, Salamanders

3140 E. 65th St., Cleveland, Ohio

GENERAL WHEELBARROW CO.
3140 E. 65th Street, Cleveland, Ohio
Send full information about the New General Concrete Buggy.

Name .....

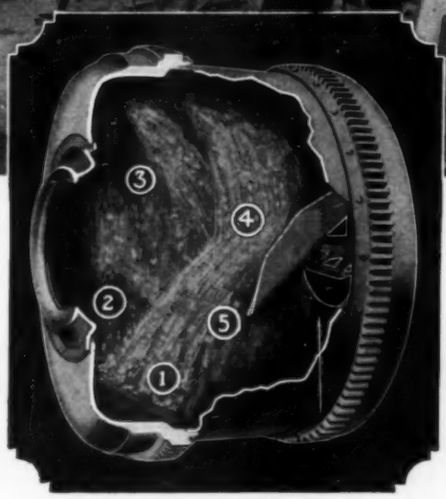
Company Name .....

Street Address .....

City, State .....

GENERAL
AKRON

KOEHRING



SPEED!

SPEED — and stronger, more uniform, easier spouting concrete!

Koehring discharge starts the instant you throw the discharge lever — gushes in full volume to the last shovelful of the batch. No nerve-wrecking dribble at the end! Koehring re-mixing action prevents separation of aggregate according to size, delivers uniform, stronger concrete, faster spouting because cement, thoroughly coating every grain of sand and fragment of stone, acts as a lubricant!

Koehring Heavy Duty construction means lower maintenance and longer service life.

Know the Koehring! Send for special construction mixer, Catalog No. CM-17.

SIZES

Pavers—13-E, 27-E. Auxiliary equipment and choice of power to suit individual needs. Complies with A.G.C. Standards.

Construction Mixers—14-S, 21-S, 28-S. Steam, gasoline or electric power. Mounted on trucks or skids. Rubber tired wheels optional. 28-S on skids only. Complies with A.G.C. Standards.

Dandie Mixer—5-S, 7-S, 10-S:—5-S single cylinder, 7-S, 10-S, two or four cylinder gasoline engine. Power charging skip, or low charging hopper and platform. Rubber tired steel disc wheels or steel rimmed wheels. Complies with A. G. C. Standards.

KOEHRING COMPANY MILWAUKEE WISCONSIN

PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES

Sales Offices and Service Warehouses in all principal cities

Foreign Dept., Room 1370, 50 Church St., New York City.

Mexico, F. S. Lapum, Cinco De Mayo 21, Mexico, D. F.

A-4515-1

Reversible Ratchet Wrenches
LOWELL

Every Pattern of Wrench Above Finds Its Place In Contractors' Equipment

To name the CONTRACTORS who are now using LOWELL REVERSIBLE RATCHET WRENCHES and finding them of great advantage would be to name some of the most prominent concerns in the country.

They buy a Reversible Ratchet Wrench because it easily proves its superiority over any other type of wrench when it comes to saving time.

They SELECT THE LOWELL because their operations call for a rugged tool and they know from experience that the design of a LOWELL is such as to make it one of the STRONGEST RATCHET WRENCHES NOW MADE.

The LABOR ITEM of any job is the HIGHEST PRICED PART OF THE JOB.

The SAVING of your workman's time is the SHORTEST AND QUICKEST ROAD TO PROFITS.

See to it that your men are provided with a LOWELL REVERSIBLE RATCHET WRENCH.

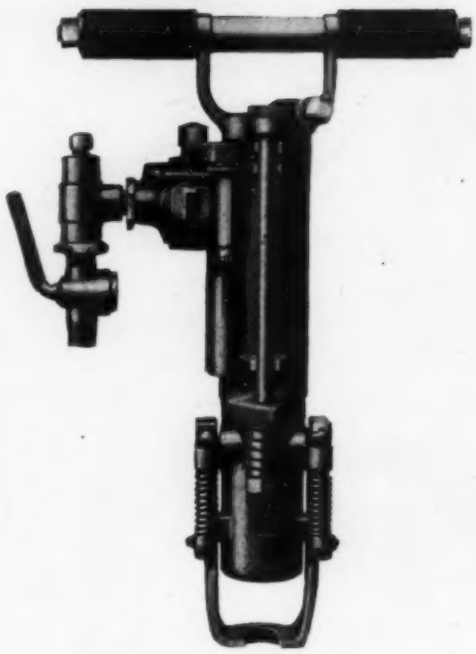
Save their time and save your money.

LOWELL WRENCH CO.
54 Commercial St.
WORCESTER, MASS.

Tear out this coupon, write your name and address below, put it in an addressed envelope and let Uncle Sam and us do the rest.

Send Catalog M.

Name .....
Address .....
City ..... State .....
Company .....



Wherever There's Rock to Drill

If you could see a Cleveland H7 drill through 26 feet of reinforced concrete and blow the iron chips to the surface. If you could see an H7 outdrill the other fellow two to one—9¼ inches per minute against his 4¾ inches per minute, to be exact. Then—

You'd understand why the H7 is unsurpassed for demolition work—or any work where there's rock to drill.

Let us show you. We'll be glad to demonstrate on your own work. *Tell us when. Address—*

The Cleveland Rock Drill Co.
3734 E. 78th St., Cleveland, Ohio

CLEVELAND ROCK DRILLS

WHAT-A 3½S NON-TILTER?

SURE-IT'S THE FASTEST 3½S ON THE MARKET-IT SAVES THE TIME A TILTER WASTES-NO DRUM TO ROLL BACK-CHARGES JUST LIKE A BIG MIXER-AND IT'S BUILT LIKE ONE

C.M.-5-Gray

The Marsh-Capron Co.
11 S. LaSalle St. • Chicago
3½S • 5S • 7S • 10S
14S • 21S and 28S
Tilters and non-tilters

DIETZ VICTOR HOT BLAST An Old Standby

MANY contractors nowadays think it more than ever desirable to use Dietz Lanterns —not merely to comply with laws requiring lights—but to provide the greatest measure of safety to the traveling public.

For this and other equally good reasons, there are millions upon millions of Dietz Lanterns guarding the uptorn highways of the world every night. Among these are always to be found a liberal sprinkling of Dietz "Victor" Hot Blast Lanterns—the "square tube" lanterns.

R. E. DIETZ COMPANY

NEW YORK

Largest Makers of Lanterns in the World

FOUNDED 1840

DIETZ LANTERNS

A regular part of the day's work

ROCKS are a regular part of the day's work of Hayward Orange Peel Buckets. The sturdy jaws hold the big rocks as well as the little stones in a secure grip.

The Hayward Orange Peel Bucket illustrated, excavated this fill consisting of blasted rock and dirt.

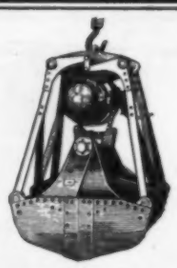
Hayward engineers will help you to fit the bucket to the job.

THE HAYWARD COMPANY
202-204 Fulton Street New York, N. Y.

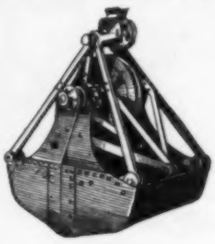
Builders of Clam Shell, Drag Line, Orange Peel and Electric Motor Buckets; Dredging, Excavating and Coal Handling Machinery; Automatic Take-Up Reels; Counterweight Drums.

—HAYCO—

Hayward Buckets



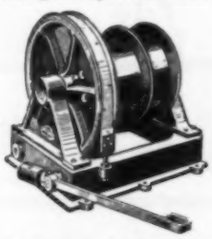
Electric Motor Buckets



Clam Shell Buckets

Orange Peel Buckets

Drag Scraper Buckets

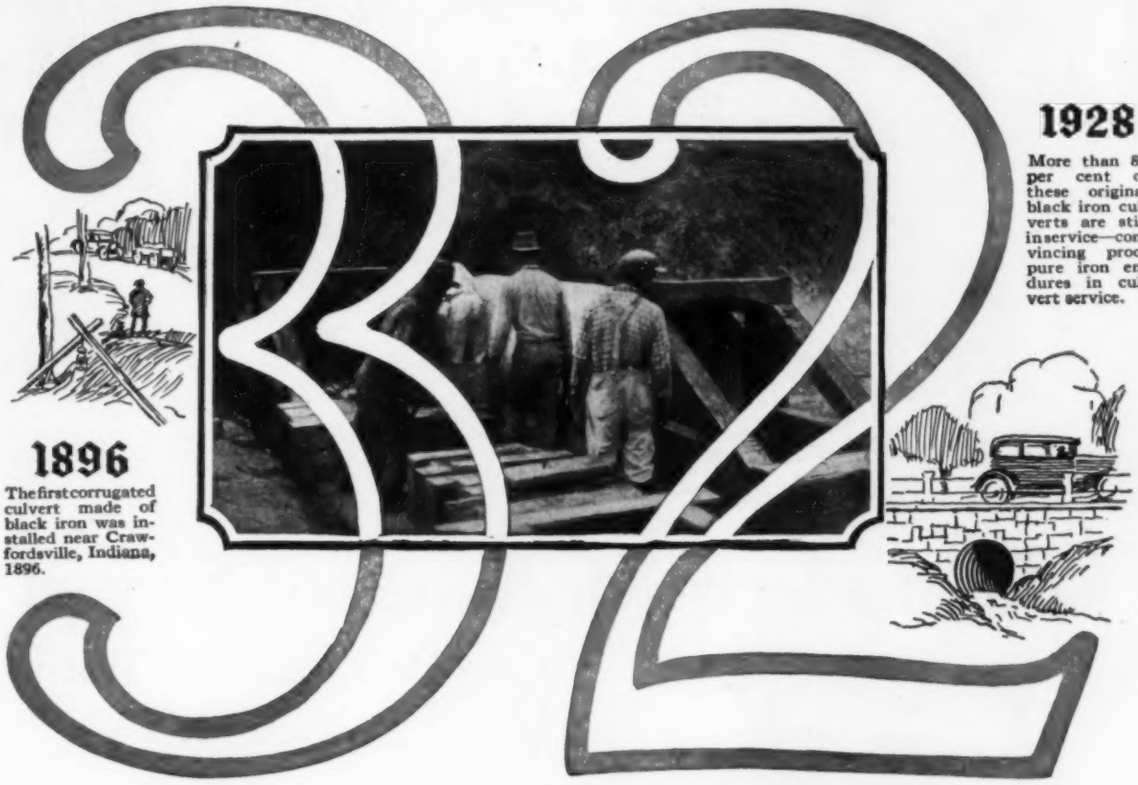


Counterweight Drums

Automatic Take-Up Reels

Skid Excavators and Dredges

A Contribution Worthy of 32 Years



1928

More than 85 per cent of these original black iron culverts are still in service—convincing proof pure iron endures in culvert service.

1896

The first corrugated culvert made of black iron was installed near Crawfordsville, Indiana, 1896.

The Armco Jacking Method

THIS month the corrugated iron culvert industry is 32 years old. Through these years many contributions have been made to the art of road building, to knowledge of better drainage, to experience in field methods.

For the contractor no contribution is of greater importance or value than the Armco jacking method. It is a contribution worthy of a great industry, with a background of 32 years of service in the road builders interest.

With the Armco jacking method you can install a pipe through an embankment under a highway, railway or street. Whether for increased drainage opening, to replace a failed structure, for an undercrossing as for cattle pass or subway, or for opening for utility pipe lines, the pipe is quickly placed without interrupting traffic and at a saving in cost for the officials and a profit for the contractor.

Opportunities for jacking jobs exist in every state and province, every large city. Wherever openings are required for any purpose there is also a profit awaiting the live contractor. Literally, in addition to your ordinary tools, the only equipment needed is a pair of sturdy jacks.

The engineering resources of this Association are at your disposal in undertaking Armco jacking jobs—as a profitable side line or as an exclusive specialty. Write us for practical working data, not available from any other source. No obligation.

Forty manufacturing plants throughout the United States and Canada assure you immediate service on drainage requirements, no matter where you may be.

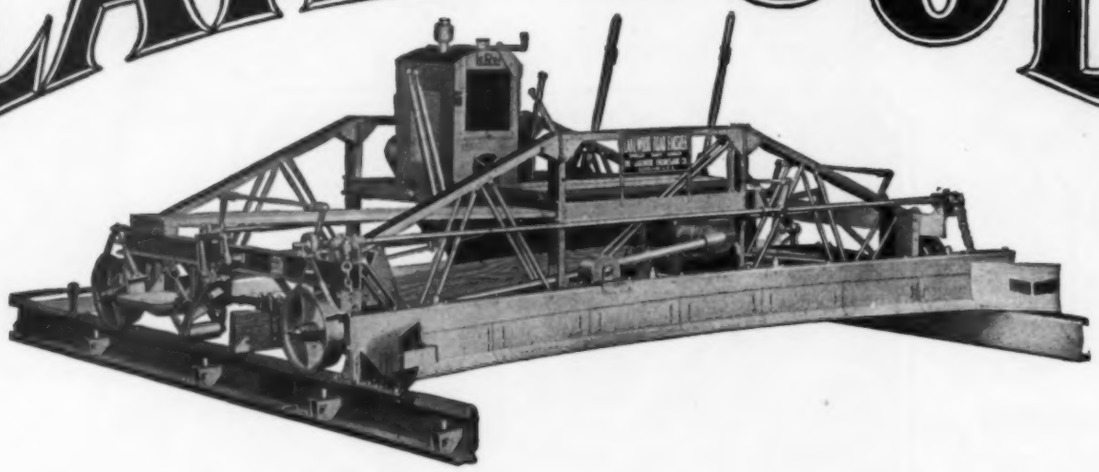
ARMCO CULVERT MANUFACTURERS ASSOCIATION
MIDDLETOWN, OHIO

ARMCO PIPE

Predominant in use because predominant in quality

©1928, Armco Culvert Mfrs. Assn., Middletown, Ohio

LAKEWOOD



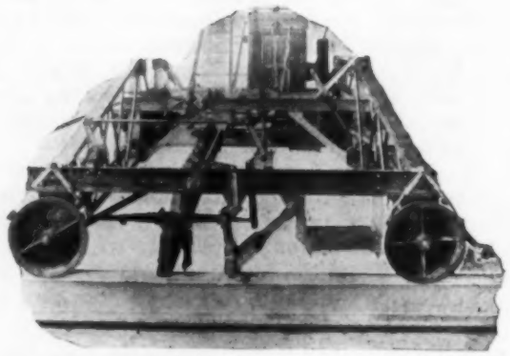
The Modern Mechanical Screed

Can Be Equipped With A Tamper

Should specifications, or the consistency of the concrete, require a tamped finish, the mechanism to accomplish it can be installed on the Lakewood Type "C" Screed in a minimum of time. The converted machine thus provides for the contractor a combined screed and tamper.

The Jack Roller Device

On each side of the frame of the machine is a device known as the jack roller. By means of levers on the operator's platform, these rollers may be pushed down against the top of the road form so as to release traction on either side of the machine. The jack roller provides an easy method of squaring the machine on the forms and for rounding curves.



This is the second of a series of advertisements outlining the exclusive advantages of the Lakewood Type "C" Screed. Complete details of the machine are given in Bulletin 47-S. You may have a copy for the asking.

EXPORT OFFICES: 30 Church St., New York City - - *CABLE ADDRESS:* Brosites

LAKEWOOD

The Lakewood Engineering Co., CLEVELAND - O.

Here's Real Performance!

Thor SIX COMPRESSOR IS A BRUTE FOR WORK

Note the above photograph which shows a THOR Six Compressor operating THREE paving breakers. Do you know of any other compressor of the same size and rating of the THOR that will duplicate this performance?

The reason the THOR is capable of running three paving breakers is because it has a Super-Charger, which by actual test, enables it to deliver 26% more air than compressors of the same capacity. The Rix Super-Charger is an exclusive, patented and fool proof feature that utilizes the piston on its idle or downward stroke to compress the additional air the THOR delivers.

Another feature of unusual importance is the unit-type design of the THOR. Both engine and compressor are mounted on a common crank case, eliminating gears, clutches and couplings. The advantages of this "direct-connected" design are tremendous and it is responsible for the extremely low up-keep cost every THOR user experiences.

There are many more features of the THOR that will interest you such as accessibility of all working parts—one-piece steel frame—vibration eliminated, etc. Get the complete story before you buy a compressor. It will cost you nothing to do this, and the saving in money involved will be well worth the time spent. Write for Bulletin 103.

Don't forget the THOR Paving Breaker. The re-coil or "kick-back" has been eliminated through an entirely new principle. A new, patented steel retainer that prevents the steel from dropping out of the nozzle is now standard on every THOR Breaker.

INDEPENDENT PNEUMATIC TOOL CO.

PNEUMATIC TOOLS

GENERAL OFFICES
600 W. Jackson Blvd.
CHICAGO

ELECTRIC TOOLS

FACTORY AURORA, ILL.

BRANCHES THE WORLD OVER

Eastern Office 1463 Broadway, New York

London Office 40 Broadway, Westminster, London

Mounted on Used Motor Trucks
Each Universal Earns $50-$100 a Day

THESE Universal Cranes were driven to this job quickly and cleaned it up in a hurry. They each earn from $50.00 to $100.00 a day. On special jobs they earn more.

They unload cars, handle tough digging and earn big profits on other jobs that ordinarily would not justify the time and expense of moving in slower, costlier, less mobile equipment.

You can drive the Universal to a job at motor truck speed and it's ready to work the instant it gets there. Speedy one-man operation plus a fast 6 R. P. M. swing speed often means as big a day's work as with larger machines. Universals unload a car or better an hour—dig 200 to 400 yards a day—all at a daily operating cost of approximately $15.00 a day.

With a clamshell, dragline, hook block, trench hoe and several other interchangeable attachments, you can handle practically any type of work with the Universal, earning $50.00 to $100.00 a day—and often two or three times this much.

Bulletin 36 is full of "brass tack" information. Send the coupon for it.

The Universal Crane Co.

976 Swetland Bldg., Cleveland, Ohio

THE UNIVERSAL CRANE CO. Swetland Bldg., Cleveland, Ohio
Send me the "brass tack" information in Bulletin 36 S
NAME
CO. NAME
STREET
CITY
STATE

UNIVERSAL MOBILITY

UNIVERSAL

CRANES DRAGLINES SHOVELS TRENCH HOES

LARGEST *and* ONLY EXCLUSIVE BUILDERS *of* TRUCK CRANES

Make this Test of ROAD FORMS

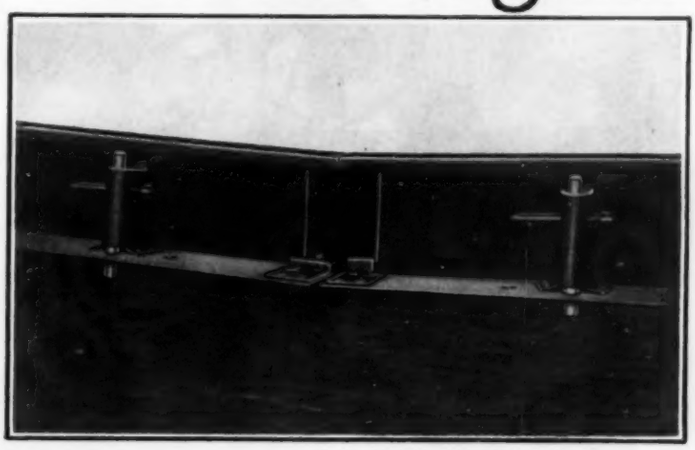
Try a break in grade

The Blaw-Knox LOCK-JOINT retains its 100% efficiency when forms are set on a curve or at a change in alignment.

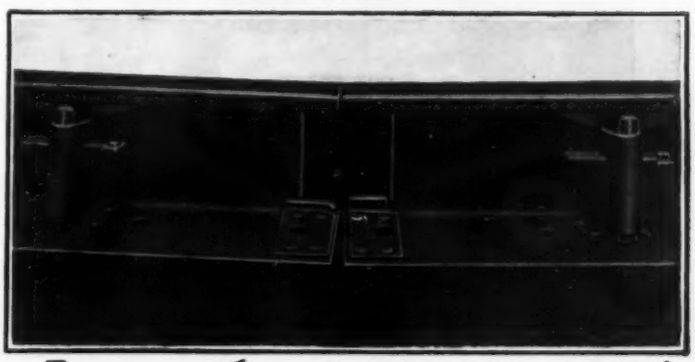
The LOCK-JOINT on Blaw-Knox Road Forms has been further improved to effect a remarkably easy entrance *and a positive joint*—regardless of the angle at which the forms are set.

Remember this—and *test* your Road Forms before you buy. Be sure you are buying a form to meet all conditions of road building, one which will last and give you full measure of value for money expended.

85% of the Blaw-Knox Road Forms manufactured are sold as repeat orders—to customers who through years of use have learned to appreciate the superior features of Blaw-Knox Road Forms.



—or a curve



—keep the joint smooth and securely locked

Write for the Catalog on Blaw-Knox Road Building Equipment.

BLAW-KNOX COMPANY
686 Farmers Bank Bldg., Pittsburgh, Pa.

Buffalo
Cleveland
Philadelphia
Birmingham
Chicago
New York
Detroit
Baltimore

Export Division
Milliken Bros.-Blaw Knox Corp.,
342 Madison Ave., New York, N. Y.

TRADE MARK BLAW-KNOX REG. U.S. PAT. OFF.

BLAW-KNOX

ACCEPT NO SUBSTITUTE

Sterling

"self-lubricating" axle bearing—guaranteed for the life of the barrow—means longer life and easier wheeling.

No oil service ever needed—permanent lubrication supplied. Rolls as smoothly when it is old as when it is new.

The Sterling wheel and axle assemblies are scientifically made to reduce wheeling effort and withstand hard service. Pre-lubricated fibre bearings in each end of the hub. The hub is wrought steel. Axle shaft is round, cold rolled steel, in place of the ordinary common bolt and is locked to malleable brackets by means of split pins—cannot turn or bind. The spokes are riveted and shouldered to the tire and cast to the hub. The tread of the tire is smooth. The Sterling wheel has "10 spokes" instead of the usual 8, this shortens the distance between spokes and strengthens the tire. This unusual wheel and axle assembly—on all Sterling barrows ***—means more capacity loads per man per day and results in more real profit.***

SPECIAL STERLING FEATURES

Self-lubricating bearings
10-spoke wheel
Malleable iron brackets
Smooth wheel face
Wrought steel hub
Riveted and cast to hub spokes
Fixed rolled steel axle
"V" front tray braces
Selected maple handles
Special tubular steel handles
Handles clamped — not bolted
Top of tray reinforced
Channel steel legs
Riveted leg braces
Extra leg shoes
Wrought iron handle tips

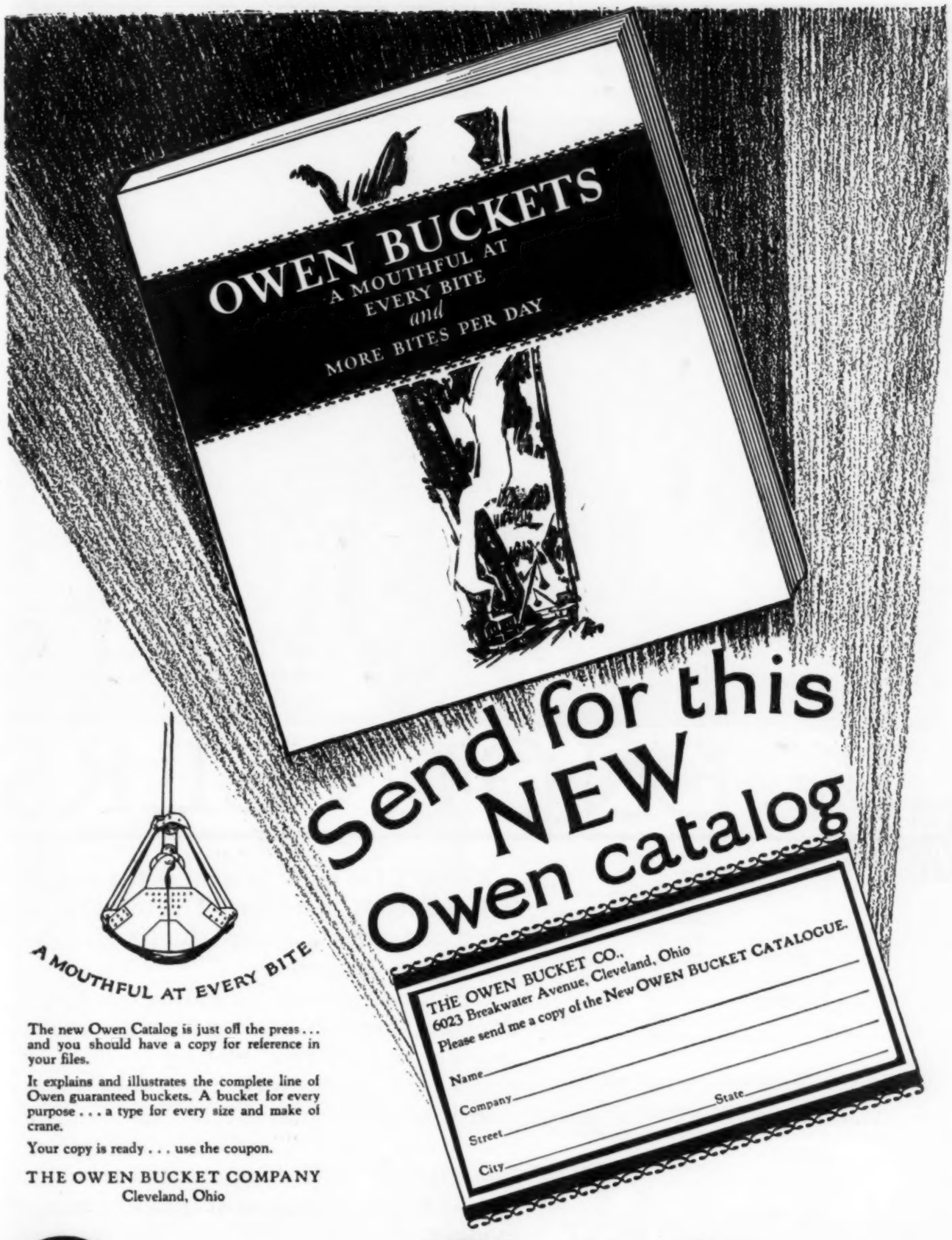
All parts interchangeable

Buy by Sterling name—leading hardware and equipment dealers have them or they can get them quickly from our complete stock warehouses at Chicago, New York, Philadelphia, Pittsburgh, Cleveland, Detroit, St. Louis.

STERLING WHEELBARROW COMPANY

STERLING ON A WHEELBARROW MEANS MORE THAN STERLING ON SILVER

Milwaukee Wisconsin


OWEN BUCKETS
A MOUTHFUL AT
EVERY BITE
and
MORE BITES PER DAY
Send for this
NEW
Owen catalog
THE OWEN BUCKET CO.,
6023 Breakwater Avenue, Cleveland, Ohio
Please send me a copy of the New OWEN BUCKET CATALOGUE.
Name
Company
State
Street
City
A MOUTHFUL AT EVERY BITE
The new Owen Catalog is just off the press . . . and you should have a copy for reference in your files.
It explains and illustrates the complete line of Owen guaranteed buckets. A bucket for every purpose . . . a type for every size and make of crane.
Your copy is ready . . . use the coupon.
THE OWEN BUCKET COMPANY
Cleveland, Ohio
OWEN
CLAMSHELL BUCKETS
INSURE A
BIGGER DAY'S
WORK
Owen Buckets

RIGHT BEHIND

The ENGINEERS

PRICES

SIXTY . . . $4600
THIRTY . . $2650
TWENTY . $2175
F. O. B. Peoria or San Leandro
2-TON . . . $1675
F. O. B. Peoria

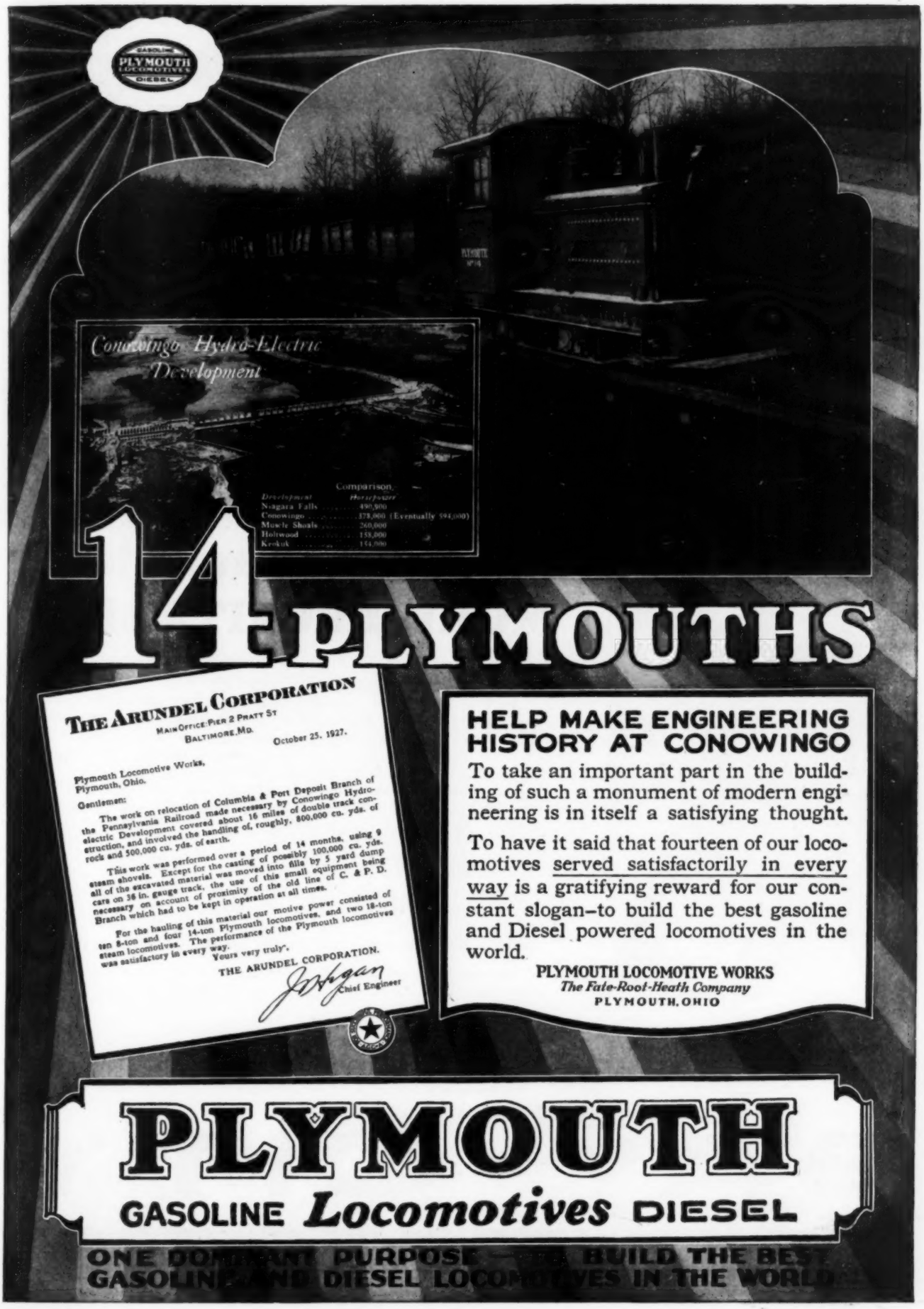
There is a "Caterpillar" Dealer near you.

CATERPILLAR TRACTOR CO.
Executive Offices: San Leandro, California, U. S. A.
Sales Offices and Factories:
Peoria, Illinois San Leandro, California
Distributing Warehouse: Albany, N. Y.
New York Office: 50 Church Street
Successor to
BEST (C. L. Best Tractor Co.) (The Holt Manufacturing Company) HOLT
3528

READY for work as soon as the way is staked out..."Caterpillar" Tractors ask no weather favors....accept the tough jobs willingly....eagerly.

Uprooting stumps, unseating boulders, dragging scarifiers, hauling from the steam shovels or pulling elevating graders or scrapers....the jobs that first follow the transit-men are hardest....that's where the power, traction and dependability of "Caterpillar" track-type tractors are most appreciated....and most quickly made evident.

CATERPILLAR
REG. U.S. PAT. OFF.


GASOLINE
PLYMOUTH
LOCOMOTIVES
DIESEL
Conowingo Hydro-Electric Development
Comparison.
Development Horsepower
Niagara Falls 490,000
Conowingo 378,000 (Eventually 594,000)
Muscle Shoals 260,000
Holtwood 158,000
Keokuk 154,000
14 PLYMOUTHS
THE ARUNDEL CORPORATION
MAIN OFFICE: PIER 2 PRATT ST
BALTIMORE, MD.
October 25, 1927.
Plymouth Locomotive Works,
Plymouth, Ohio.
Gentlemen:
The work on relocation of Columbia & Port Deposit Branch of the Pennsylvania Railroad made necessary by Conowingo Hydro-electric Development covered about 16 miles of double track construction, and involved the handling of, roughly, 800,000 cu. yds. of rock and 500,000 cu. yds. of earth.
This work was performed over a period of 14 months, using 9 steam shovels. Except for the casting of possibly 100,000 cu. yds. all of the excavated material was moved into fills by 5 yard dump cars on 36 in. gauge track, the use of this small equipment being necessary on account of proximity of the old line of C. & P. D. Branch which had to be kept in operation at all times.
For the hauling of this material our motive power consisted of ten 8-ton and four 14-ton Plymouth locomotives, and two 18-ton steam locomotives. The performance of the Plymouth locomotives was satisfactory in every way.
Yours very truly,
THE ARUNDEL CORPORATION.
J. S. Hogan
Chief Engineer
HELP MAKE ENGINEERING HISTORY AT CONOWINGO
To take an important part in the building of such a monument of modern engineering is in itself a satisfying thought.
To have it said that fourteen of our locomotives served satisfactorily in every way is a gratifying reward for our constant slogan—to build the best gasoline and Diesel powered locomotives in the world.
PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
PLYMOUTH, OHIO
PLYMOUTH
GASOLINE Locomotives DIESEL
ONE DOMINANT PURPOSE — TO BUILD THE BEST GASOLINE AND DIESEL LOCOMOTIVES IN THE WORLD

16B 20-TON TRENCHER

Two bang-up diggers that make all such jobs MORE PROFITABLE

TOP picture shows the 1928 model Bay City Tractor Shovel stripping heavy blue clay and hard pan from one of the three stone quarries owned and operated by John Maxwell & Sons, Saugerties, N. Y. This one machine is used to strip all three quarries, as needed. Travels under its own power, without any dismantling, from one quarry to another, at a speed of 3½ miles an hour. . . . The Tractor Shovel weighs 10 tons, and is convertible to shovel, trencher, clamshell, dragline or backfiller. Lifts 3000 lbs. at 18-ft. radius. Swings ¾ circle. Digs ditch to 11 ft. McCormick-Deering power.

At left, the picture shows the Bay City 16-B ¾-yd. 20-ton Convertible Excavator, equipped with trench bucket, digging a deep sewer trench which runs under the Reading Railroad tracks near Port Reading, N. J. It digs up so close under the track that very little hand tunneling is required. Picks up the hard asphalt surface easily, after it has been notched along the side. Full crawler mounting. All steel construction.

These machines are proving everywhere that they are highly profitable investments. Eastern service station at Roselle, N. J. Ask for Bulletins.

TIMKEN BEARING EQUIPPED

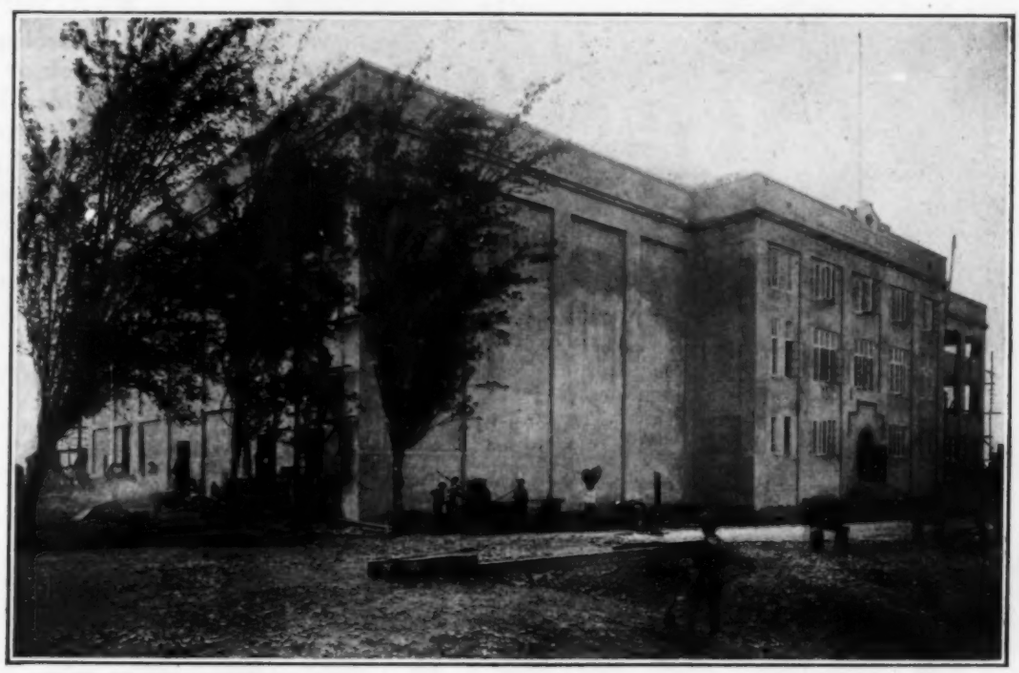
Bay City Dredge Works

New York Office
302 Broadway

Bay City, Mich.

BAY-CITY

FULL OR PART CIRCLE —SHOVELS—TRENCHERS—SKIMMERS



Frigorifico Nacional S.A. Ltd. *Callao, Peru*

The Foundation Company
General Contractor

An industrial building recently designed and constructed by The Foundation Company as general contractor, is the Frigorifico Nacional, or abattoir and cold storage plant, at Calao, Peru. The latest types of equipment and methods of construction make it modern in every respect.

THE FOUNDATION COMPANY

CITY OF NEW YORK

Office Buildings
Industrial Plants
Warehouses
Railroads and Terminals
Foundations and Underpinning
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ATLANTA
PITTSBURGH
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Hydro-Electric Developments
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Highways
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Bridges and Bridge Piers
Mine Shafts and Tunnels

BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES

A Browning Truck Crane on highway construction work.

Faster—Easier Handling

BROWNING Gasoline Cranes—Truck or Crawler—are ideal handling units for construction work. Their ease of handling and their remarkable speed make possible faster work at a lower cost.

THE BROWNING CRANE COMPANY
16226 Waterloo Road
CLEVELAND, OHIO, U. S. A.
New York, Chicago, Pittsburgh, Birmingham
Sales Agents:
Portland Los Angeles Montreal Toronto
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BROWNING

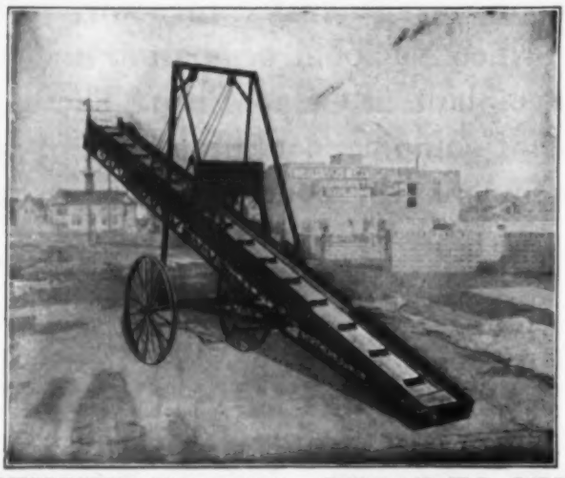
LOCOMOTIVE, TRUCK and CRAWLER CRANES—STEAM, GASOLINE, ELECTRIC

MATERIAL MOVING *THE SENSIBLE AND ECONOMICAL WAY.*

THE NORTHERN "BUILT BETTER" MATERIAL HANDLING EQUIPMENT

7 POINTS

Improved Hoisting Truck
Rigid Frame
Closely Spaced Rollers
Straight or Swivel Wheels
Gas Engine or Motor
Easily Portable



CONVEYORS

Portable or stationary in any style, length, or capacity are practical and suitable for every material handling need.

"NORTHERNS"

Move sand, gravel, stone or wet concrete with a maximum of quantity for a minimum of cost.

INEXPENSIVE TO BUY—CHEAP TO OPERATE

Northern Conveyor & Mfg. Co.

JANESVILLE — WISCONSIN

On the 11th floor of the Shaw Bldg., showing CP-114's drilling into reinforced concrete.

The 5-story Farmer Street Bldg., giving way to the rapid, powerful blows of CP-114's.

Another view of the steel-and-concrete Farmer Street Bldg. Fourteen CP-114's were in action when this photo was taken.

CP-114's Make Quick Work of Demolishing Three Large Buildings To Make Room For One of America's Largest Stores

Three buildings with a ground area of 70,000 sq.ft., five, eight and thirteen stories high, respectively, had to be razed to make room for an addition to The J. L. Hudson Company's store, Detroit. Using CP-114 Demolition Tools, the general contractors, The Bryant and Detwiler Co., completed the work in six weeks, during cold weather. The fact that CP-114's do not "freeze" even in the coldest weather, made it possible for the work to proceed without interruption.

Hudson's Store as conceived by the architect. CP Air Compressors and CP Pneumatic Riveting Hammers are being used in its construction. Whether the work be tearing down or building anew, there are efficient CP Tools for the purpose.

CP Tools Save Time and Money

Costly and laborious hand methods are fast giving way to efficient air-operated CP Demolition Tools. For tearing out concrete and brick foundations, cutting asphalt pavement, trenching, pavement breaking, tamping, back-filling, driving sheet piling, etc., CP Demolition Tools are establishing remarkable records for Speed, Efficiency, Low Maintenance and the Saving of Time, Labor and Money. Contractors, cities, public utility companies and industrial plants are invited to write for Bulletin No. 858.

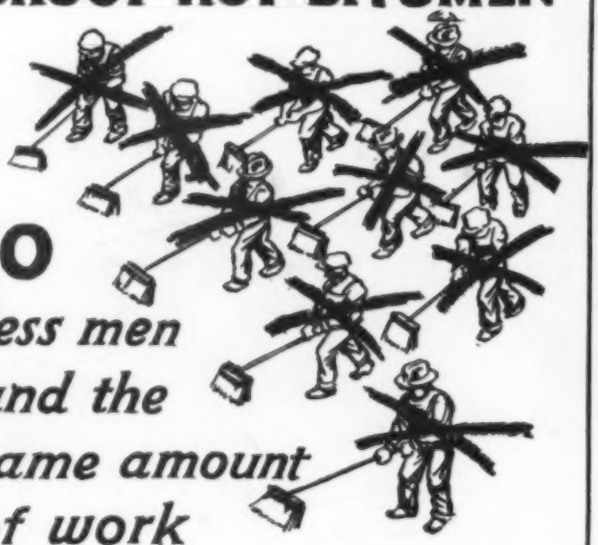
CP-114
Demolition Tool

Chicago Pneumatic Tool Co.

Sales and Service Branches all over the World R-129

6 East 44th Street New York, N. Y.

SHOOT HOT BITUMEN



10 *less men and the same amount of work*

No need of keeping 12 men on the job when 2 men with the

Quigley Bitumen Gun

can do the same amount of work—and do it better.

You can spray on protective coatings—hot tar, pitch, asphalt, enamel, paraffine, wax—six times as quickly with this Bitumen Gun; and have far better control of the volume and consistency of materials used, as well as uniformity of protective coating. You can figure accurately, too, the cost of materials and time.

The Quigley Bitumen Gun, wherever used has quickly paid for itself.

Write for Bulletin CM-301

More than 100 Quigley Distributors in this and foreign countries

QUIGLEY

FURNACE SPECIALTIES CO.

26 Cortlandt Street, New York City

Buhl

AIR COMPRESSORS

Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

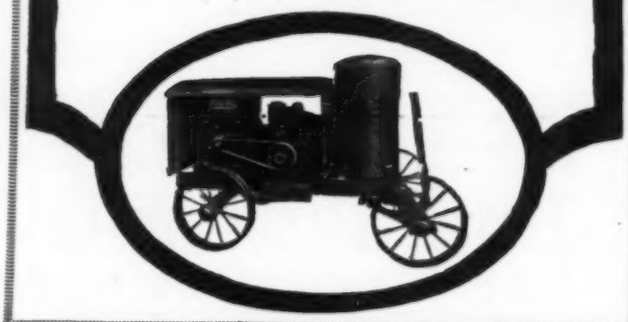
There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

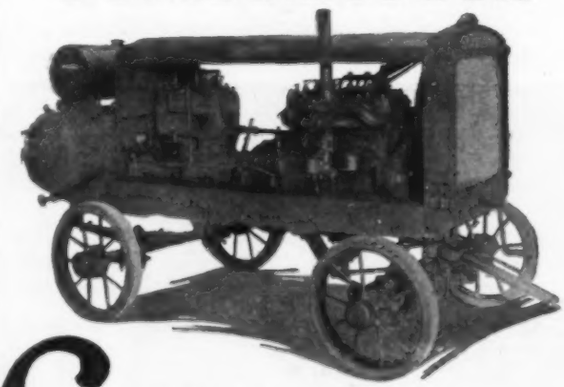
THE BUHL COMPANY

Manufacturers

37 W. Van Buren St., CHICAGO



PORTABLE AIR COMPRESSORS



Built in four sizes with displacements of 60, 120, 180 and 240 cubic feet, "SCHRAMM" multi-cylinder engine-driven compressors cover all the requirements of the field.

Conveniently Located Stocks and Service

Schramm, Inc.

West Chester, Penna.

Offices and representatives in all important cities.

Schramm

The Curtis Portable Compressor saves the cost of a special operator

1. Saves Labor

Where a trailer type compressor outfit is used, it has become common practice to put a non-producing man on the payroll to attend the compressor. This man's wages in a single season may amount to the price of the outfit. This entire expense can be eliminated with a Curtis portable compressor.

The Fordson provides power both for moving and operating the compressor. Any tool operator can drive it when necessary. No special attention is required, since the compressor is automatically cooled and lubricated. Speed and pressure are controlled by suitable governors. Fuel and water tanks are ample for a full day's operation, and Fordson service is available everywhere.

2. Saves Time

The Curtis unit saves the time involved in shoving or dragging the ordinary compressor about. On work which constantly moves forward, as along a road or street, the Curtis is kept always within hose length of the work, thus eliminating the time, expense and inefficiency of ever lengthening air lines.

3. Saves Fuel

Long air lines greatly reduce the delivered volume of air, while power cost remains the same. Thus the elimination of long air lines by means of a Curtis results in much lower fuel cost per unit of air delivered. Fuel is further saved through having only one engine to operate; and frequently the difference in cost of kerosene as against gasoline proves to be a third considerable saving. Lessened fuel cost alone will often pay for the Curtis unit.

4. Saves Investment

The complete Curtis unit with Fordson costs less than other portable units of similar capacity. If you already have a Fordson, your additional investment is cut down still further. When the compressor is not in use, the Fordson can be detached and utilized for many other purposes, so that even its small cost should be divided over many jobs.

Mail the coupon and let us send you actual figures on cost savings in many kinds of work. They will surprise you.

Portable Compressor, both operated and moved by Fordson.
Model "A" Air Compressors. Full self-oiling. Water cooled. Up to 50 H. P.
Style "V" Two-Stage Compressor. Air-Cooled. ¾ to 2 H. P.
Air Hoists, Cranes, Trolleys. Fast, economical, speed up production.
Paint Spray Compressor. Hand unloader. (By-Pass for starting.)
Compressed Air Car Wash System. A complete cleaning service.
Hydraulic Car Washer, 1 H. P.; 2 H. P.; 2 H. P. oversize.
Rotating Auto Lift, Oil-Locked. Absolute control and safety.
Air Stands. Reel type or tower type. Easy to operate.
P1

Check items in which interested.

Gentlemen:—Please send me full details on the Curtis Portable Compressor, your proposition and prices.

Name .....

Address .....

.....Have you a Fordson?.....

Curtis

Pneumatic Machinery Company

Seventy-Fourth Year **St. Louis**

1995 Kienlen Ave., St. Louis 5518-N Hudson Terminal, New York

Another Big Job Poured by Smiths

Jordan Dam as it appeared Sept. 1st, 1927, approximately nine months after work was started

Jordan Dam of Alabama Power Co.

Huge concrete projects can be pushed forward rapidly with the rugged, dependable Smiths developed for just this work. The speed and smoothness of the Smith Double Cone Drum have never been equalled by any other design. A quick tilt discharges the batch in a few seconds— another quick tilt, and aggregate pours into the drum. This same speed is to be had in a Smith in any capacity from 2½-S up to the great 112-S pictured here— the same smoothness of the balanced "end-to-center" mixing action that means long life.

The two 112-S (4 cu.yd.) Smith Mixers as installed at the Lock 18 Development of Alabama Power Co., now known as the Jordan Dam

Catalog 528—just out—should be in your files

The T. L. SMITH COMPANY
1084 32nd Street, Milwaukee, Wis.
Sales Offices and Service Stations in All Principal Cities

IRON MULE
The Original 2 Yard Tractor Dump

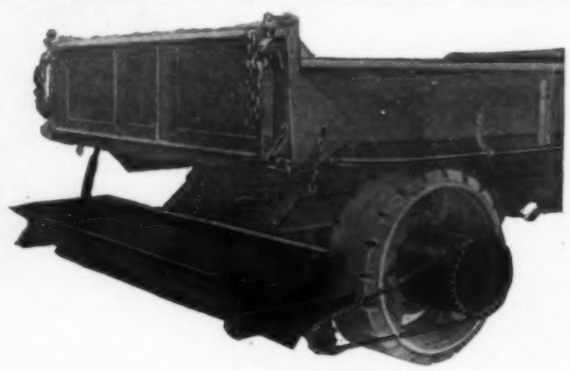
New Breed of Iron Mule Setting a Fast Pace

The new Iron Mule powered by a special 10-20 McCormick-Deering tractor is already proving itself a worthy companion for the Fordson Iron Mule, that Hughes-Keenan short haul marvel that sliced earth moving costs wherever it was used.

The special McCormick-Deering tractor gives the new Iron Mule extraordinary and abundant power for the "stickiest" going. And it's built to stay on the job— rugged, heavy, reinforced steel throughout. The McCormick-Deering Iron Mule is shipped complete from our factory. Just add gas and start cutting your earth moving costs at once. *Write for complete information today.*

HUGHES-KEENAN CO., Mansfield, Ohio

HUGHES-KEENAN
Steel Dump Bodies



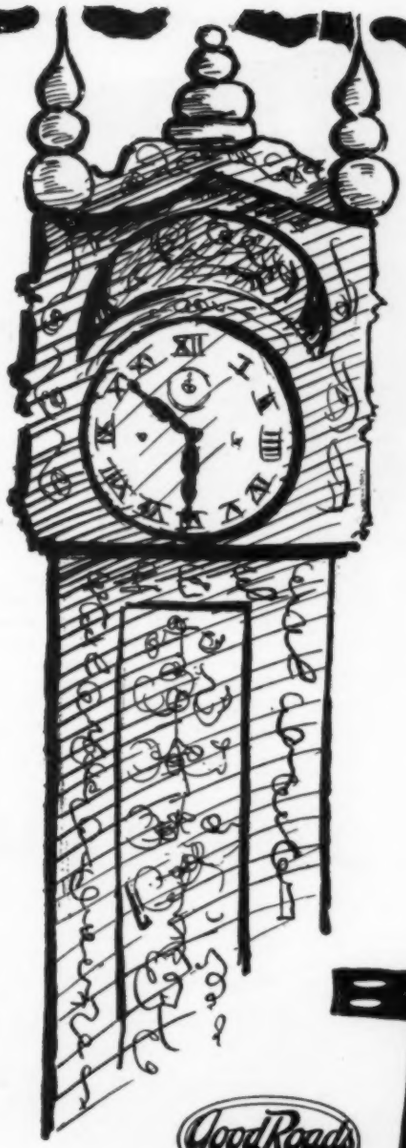
A record-breaking Chip Spreader

A prominent New York county highway superintendent spread and covered 6000 gals. of oil a day with 2 Acme Spreaders and 7 men. With a hand labor spreading crew of 25 men, the best he could do was 4000 gals. a day.

Widely used by State highway departments, counties, municipalities and contractors for covering oiled roads, bituminous binder, and for sanding ice bound streets. Great time and labor saver. Can be easily attached to any truck. Simple and durable construction.

Write for Full Details.

Acme Road Machinery Co.
Frankfort, N. Y.



now is the TIME

"1030"

IF YOU ever intend to really make money, if you ever intend to get the best results from your quarry, and if you ever expect to be free from equipment worries, ***now is the time*** *to investigate the possibilities of the Good Roads Champion No. 1030 Crusher. It can be furnished either as a stationary crusher on its own mounting with folding elevator, or incorporated in a complete portable gravel crushing and screening plant.*

Don't put off what you know you should do today.
Write

The Good Roads Machinery Company, Inc.
Kennett Square, Pa.

BOSTON CHICAGO PHILADELPHIA PITTSBURGH NEW YORK

Metaforms

for every form building requirement

from one job to the next

SAVE on labor, time and material with Metaforms, the Interlocking Steel Units.

No waste of lumber—assembled quickly by inexperienced labor—taken down in a jiffy and ready for the next job—used over and over again.

Cheaper by far and *better* jobs.

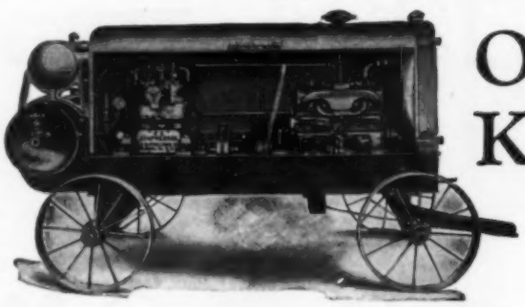
METAL FORMS CORPORATION

Milwaukee, Wis.

THIS new 96-page booklet is filled with information on how you can reduce your excavating and material handling costs. You'll find page after page of descriptions, pictures and drawings, showing you what other users are accomplishing with Sauerman Power Drag Scrapers. Your name and address on a post card is enough to tell us where to send the booklet. There is no obligation. Mail the card today.

SAUERMAN BROS., Inc.
480 S. Clinton St., CHICAGO

SAUERMAN



O. K.

Pep up those air tools! with an O.K. Air Compressor

O.K. Portable Hoists

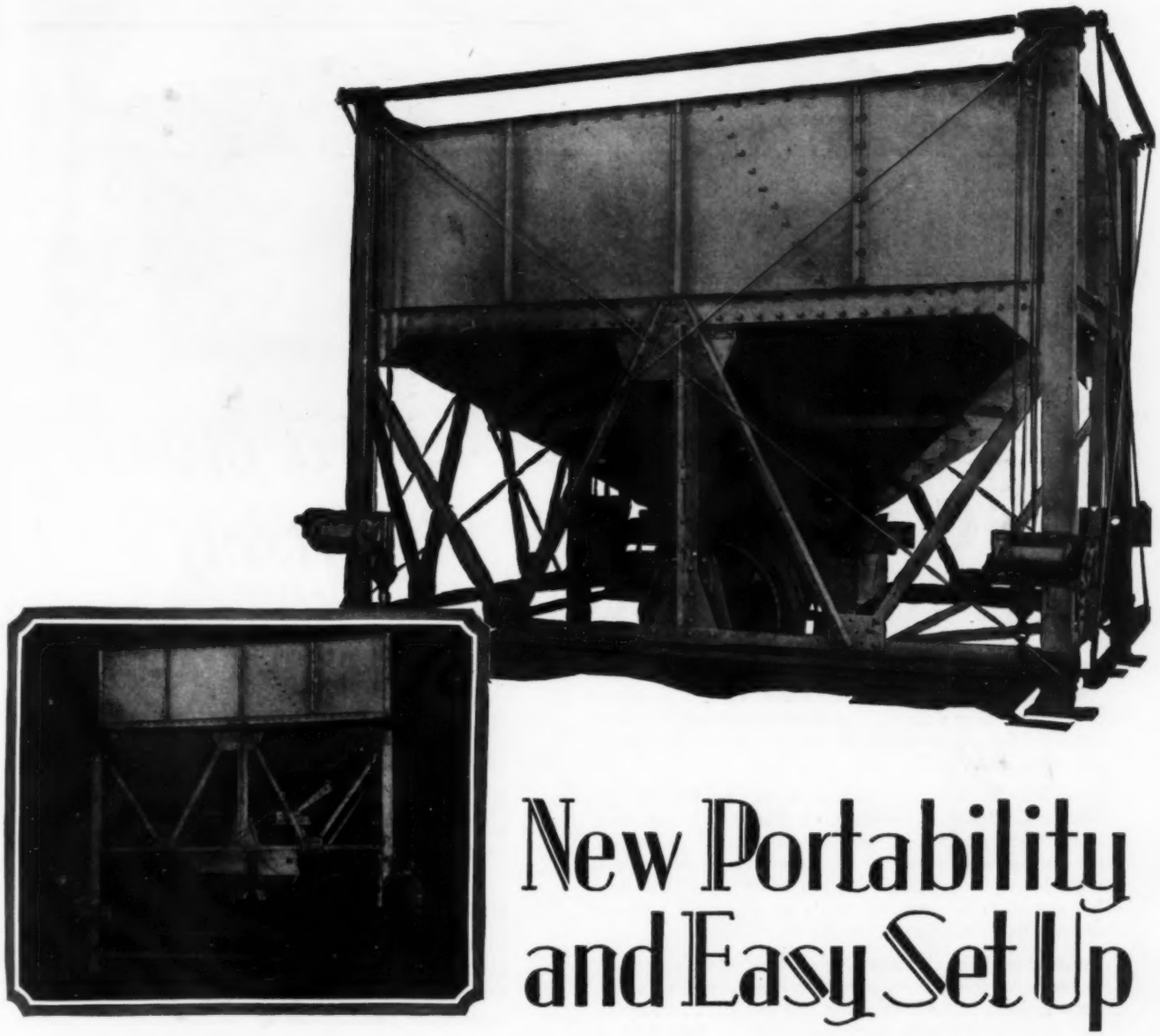
O.K. Portable Elevators

There's nothing to take the place of air on portable jobs. Get the most air for your money! O.K. Compressors have powerful, sure-fire engines, large capacity, special valves, a new type safety device to prevent racing—and other special useful advantages. Get complete information and prices.

Some valuable territory open to agents. Write

O.K. Clutch and Machinery Co.

P.O. Box 305 Columbia, Pa.



New Portability and Easy Set Up

THERE'S a new Butler Bin for general contractors! It is designed for use in crowded areas or in excavations where it is not convenient to use a crane or a gin pole. Just trundle it along on its own rubber tired wheels—under trolley wires, in narrow alleys or in crowded streets. Place it in position, loosen the trucks upon which it rides and raise it quickly into operating position with four winches. Four men can have it working in half an hour. It's the same sturdy, dependable Butler Bin that you've always known—just modified to meet a condition that general contractors often encounter. Ask for further information.

Write Us or Our Nearest Distributor

BUTLER BIN COMPANY

WAUKESHA-WISCONSIN

12

NO MORE *Operating Delays*

START the engine—and in less than sixty seconds you're handling water . . . . *no more operating delays* . . . . ditches drained or water supplied for construction at but a fraction of former pumping costs.

Included as standard equipment on this American-Marsh Centrifugal Contractor's Pump is a patented automatic primer that works every time. It primes the pump immediately . . . . then keeps it primed, regardless of how tough the job or how cold the day. No attention is required . . . . no $3 to $5 per day for a man to watch the pump.

Contractors the country over are showing great interest in this automatically primed, extra husky, light weight, but LOW PRICED outfit . . . . capacities to 72,000 gallon per hour. Very definitely, it will pay you to investigate. *Mail coupon today for full details.*

AMERICAN STEAM PUMP COMPANY
Battle Creek, Michigan

Kindly send me your Bulletin 50 describing the new Type MEP Portable Pump which is automatically primed.

CHECK BELOW, IF INTERESTED

☐ Without obligation have your sales representative call.

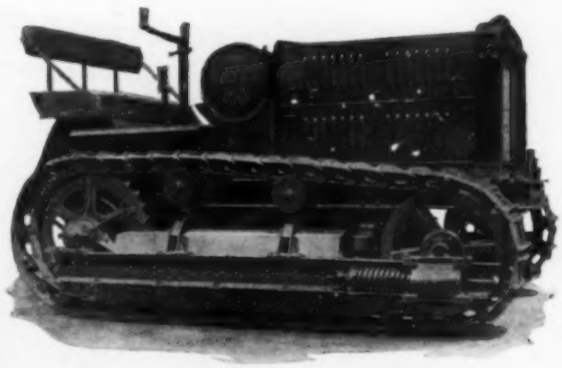
Signed .....

Firm Name .....

Address .....

.....

AMERICAN-MARSH
Type MEP Portable Pump



"In a class by itself"

The loyalty of users of Bates Tractors we believe is the best recommendation these Tractors could have. It is a remarkable feature of Bates machines.

Bates Tractors are carefully designed, and built with hard service in view. The completed machine always embodies the best in dependable haulage.

Extreme length of crawlers, makes Bates machines easy to handle under all conditions. Due to this additional amount of traction on the ground they are able to negotiate soft spots.

The heavy swinging drawbar with its shock absorber springs keeps the tractor from sloughing around on off-side pulls.

These are but a few descriptive high lights. *Send for the complete BATES story which is sent without obligation.*

BATES TRACTORS

BATES MANUFACTURING COMPANY
Joliet, Illinois

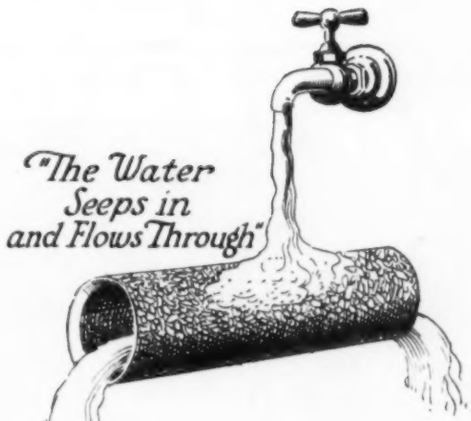
The Most Efficient Drain Pipe for Sewage Disposal Plants!

WHEN Danbury, Conn., recently installed an extensive sewage disposal drainage area, it chose "Poroswall" Rapid Drain Pipe because it has ten times the drainage capacity of ordinary, solid-wall drain pipe.

Drain pipe with solid walls must be laid with its sections sufficiently separated so that liquid matter may enter. These openings are usually inches wide. But, naturally, much of the sludge enters at the same time, settles, clogs and prevents free-flowing conditions.

"Poroswall," however, is laid with its joints tight together. But, as its name implies, *its walls are porous* and have hundreds of small openings throughout their entire areas. These are so numerous that liquid matter seeps through at all points, when the pipe line is properly laid surrounded by crushed stone, as opposed to rushing in at a few large openings and carrying much clogging-matter along with it, which is the case with solid-wall drain pipe.

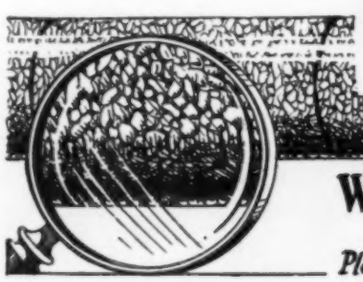
Says City Engineer Charles O. Brown, of Danbury: "It ('Poroswall') has given good satisfaction. Shall continue to use it in new work."



"A Foot of Drainage for Every Foot of Pipe."

WALKER POROSWALL RAPID DRAIN PIPE

Send Coupon below for sample Pipe Section & Booklet



Please Print!

[Name]

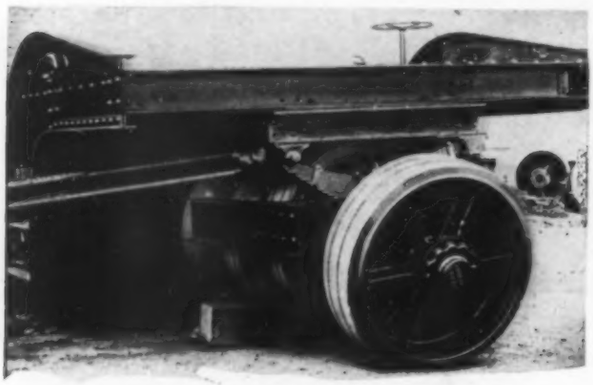
[Address]

Walker Cement Products, Inc.
Little Ferry N.J.
Plants at Little Ferry, N.J. & Baldwin L.I., N.Y.

C.M

Why They Turn to Rogers

ONE of the striking advantages of the many possessed by Rogers Heavy Duty Trailers is the 90 degree turning radius. It is the result of the Gooseneck construction that distinguishes Rogers Trailers.

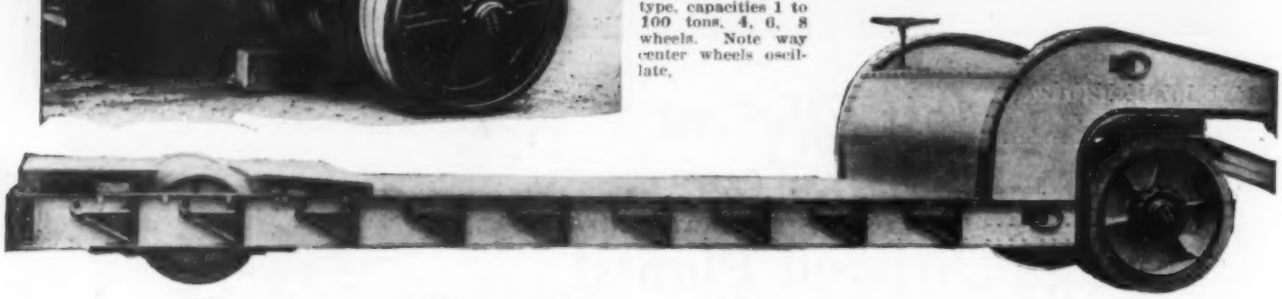


Add to these features the great strength and endurance of Rogers Trailers—the rocking axles that provide safety on uneven roads by permitting 8 inches oscillation of the center wheels. A Rogers runs on any highway.

Then you will understand why there are over 200 enthusiastic owners of Rogers Heavy Duty Trailers, sixteen of whom have repeated to the tune of 42 machines—not to mention more than 3000 light weight trailers in Africa alone.

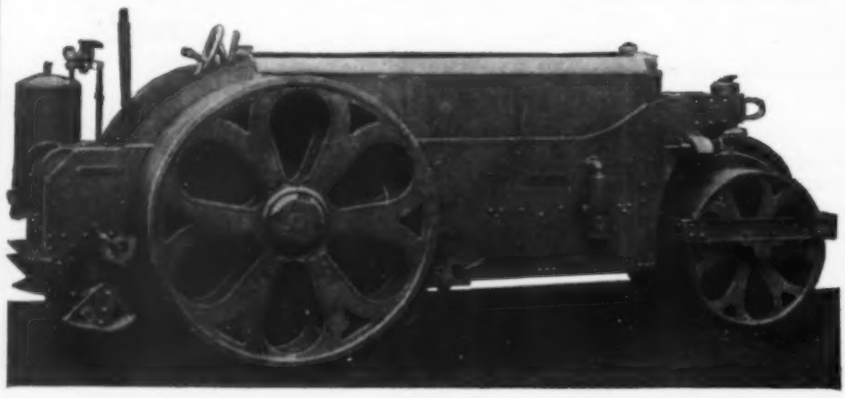
Let Rogers solve your haulage problems, too. Write.

Rogers "Gooseneck" type, capacities 1 to 100 tons, 4, 6, 8 wheels. Note way center wheels oscillate.



Rogers Brothers Corporation

ALBION, PA.



HUBER

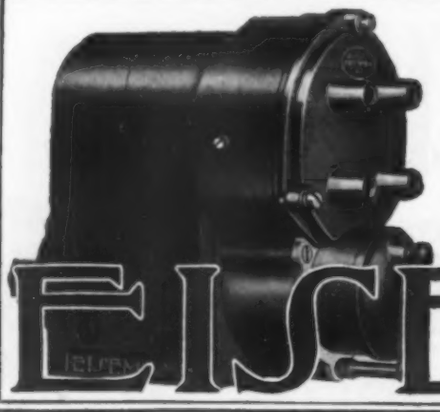
4 CYLINDER

MOTOR ROLLERS

Powerful and dependable, quick in action, economical to operate. Made in 4 sizes (5-7-10-12 Tons). Send for Huber Motor Roller Catalog.

THE HUBER MFG. CO.

315 E. Center St., Marion, Ohio



The Preferred Magneto

~for Construction Equipment

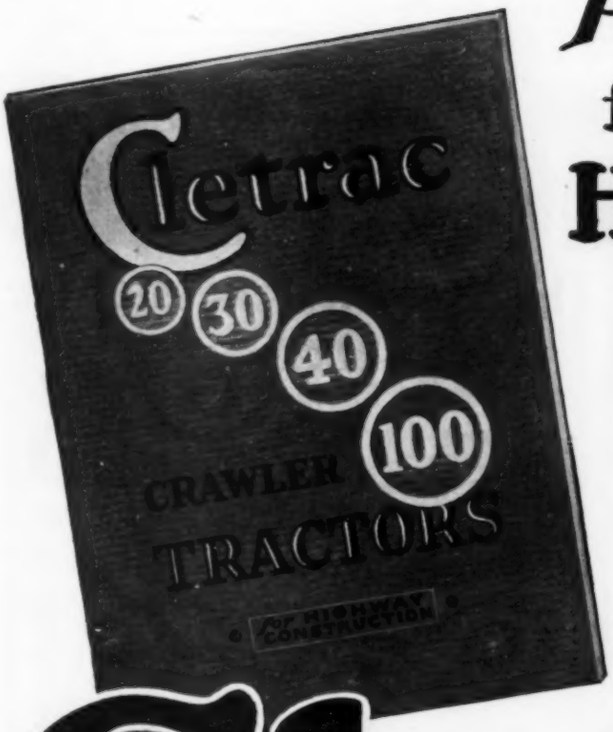
The overwhelming choice of the builders of high quality equipment. Favored by contractors everywhere.

EISEMANN MAGNETO CORPORATION

165 Broadway - New York

EISEMANN

Tractors of *Proved Value* for Every Need of Highway and Industrial Work!



Write today for this Catalog which gives full details of the complete Cletrac line—

The Cleveland Tractor Co.
Cleveland, Ohio

Cletrac

The Famed Witch-Elk Engineers' Boot

Smoked Elk uppers, waterproofed. Wing tip. Full leather lined. Full bellows tongue. Heavy oak outsoles, waterproofed. Chrome middle soles. Flange heel.

Other Boots Gave Him 'ell

Read what A. G. B. Jay*, well known engineer and writer, says of the famed Witch-Elk Engineer's boot:

"I always wear your boots when I can get them. Last year I had to have some new boots on short notice but could not get a fit in your make and so took an expensive pair of boots. These boots gave me hell for six weeks.

"I have worn your boots since 1912 when I got a pair at Little Rock and did not expect much of them because they looked so delicate and 'pretty.' Well for six months of slush, mud and plain wading in streams and swamps, those 'pretty' boots never leaked a drop.

"I wear boots almost all the time in my engineering work. And your boots last longer and are waterproof for a longer period than any others. And I have tried them all."

Light-weight, long-wearing, waterproof—Witch-Elk boots, made especially for engineers, stand more punishment and give more comfort than any other boots made.

At your local dealer or write us direct, as so many engineers do.

WITCHELL-SHEILL COMPANY, Detroit, Mich.

World Wide Reputation—On Fields of Recreation

*Address on request.

This is Your Ticket

For a Free Tour of Over 50 Contracting Layouts

Here's a chance to make a free inspection tour of over 50 progressive contracting jobs, without going outside of your own door. Barber-Greene men have gathered information, pictures and layouts on interesting features of contracting work in every section of the country. The best of these have been collected in the 1927 edition of *Contracting with Barber-Greenes.* Sending this ticket brings your copy—send it today.

Name .....

Address .....

City ..... State .....

Company .....

BARBER-GREENE CO. *Representatives* 530 W. Park Av., Aurora, Ill. *in Fifty Cities*

BARBER GREENE

Portable Belt Conveyors — Self Feeding Bucket Loaders

Coal Loaders . . . . . Automatic Ditch Diggers . . . . . Coal Feeders

ROLLERS

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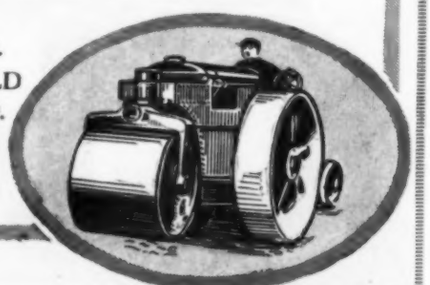

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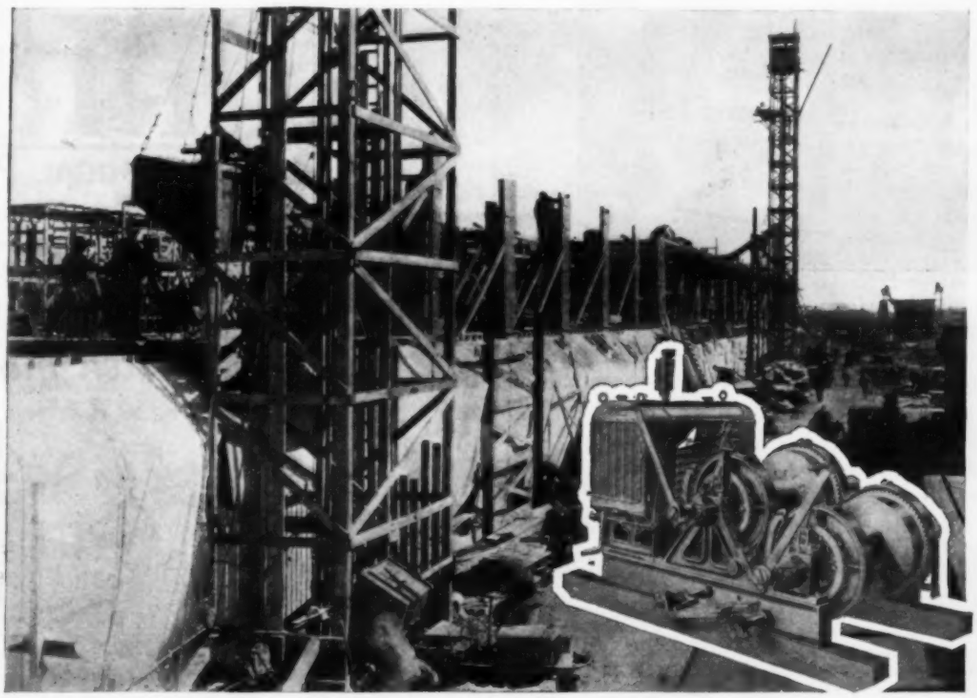

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more water per dollar with
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Barnes pumps show their greatest value when operating under severe conditions. Their ability to operate steadily under high pressure when pumping thru miles of pipe at varying elevations makes them a profitable investment.

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WANTED! *Distributors for "the best trench pump in the world"!*

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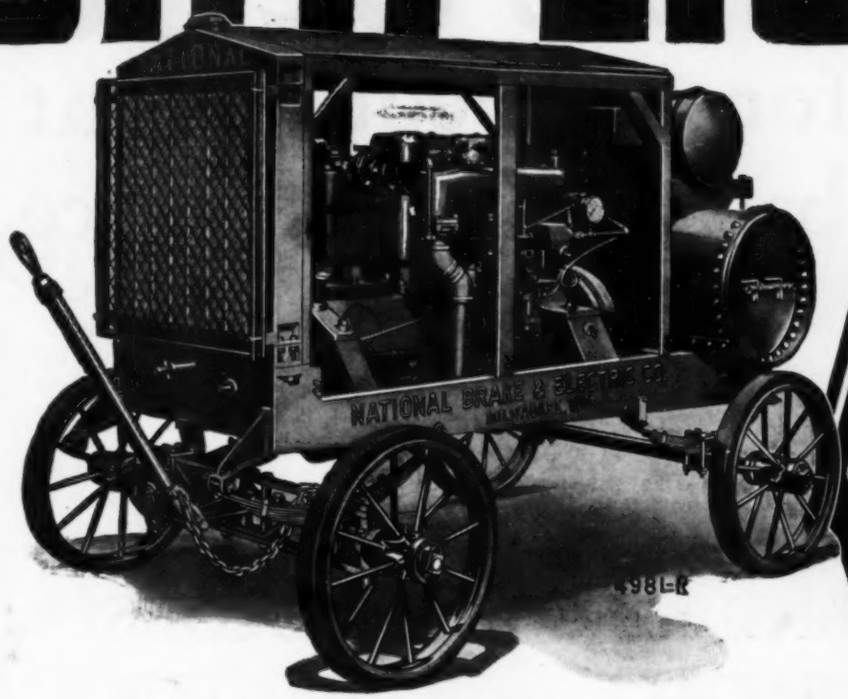

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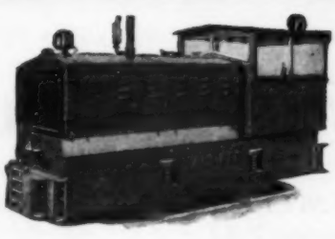

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If you do you need a
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These machines are not only rapid and economical of labor, but the bends are made uniform and without danger of buckling or crushing.

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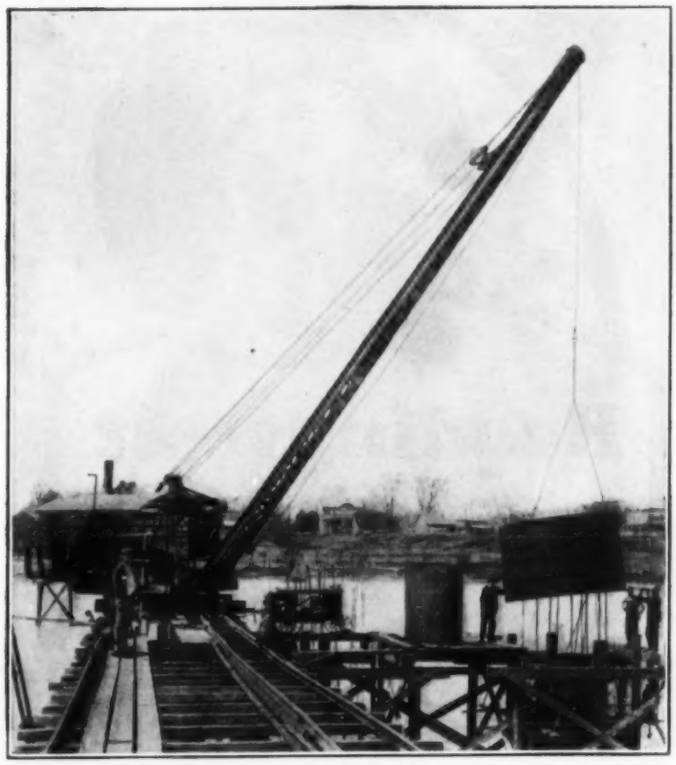

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they are designed to take a two, or a three-drum hoisting engine.

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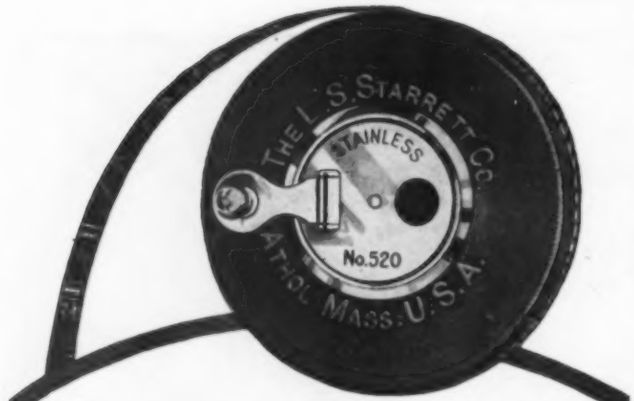

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PRICE $160

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Do your leveling and plumbing the modern, accurate way. Mistakes are always costly. By actual experience you can save an average of $2.00 a day or more on every job as a result of the speed and accuracy possible with this specially designed Beckmann level and transit.

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This model is designed for the use of builders and contractors. It cuts time and mistakes in leveling buildings, floors, walls and foundations — in running lines for fences, streets and ditches—in surveying lots and locations.

Easy to learn to use. Big volume makes the price very low

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This compact, end discharge, all purpose one bagger holds one full bag mix, does anything a side discharge mixer will do *and more.* Portable—trails on dual tires and springs; one man lifts it. Fast—has Accurate Measure Water Tank, Automatic Skip Shaker. Sturdy—100% roller bearing, all-steel construction.

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LOW CHARGER OR LOADER TYPES !

Jaeger Tilters with Loaders, 3½-5-7-10-14 Foot Sizes—Heavy Duty Tilters up to 28 Ft.—Trailers $169 up—Write for Catalog and Prices.

Compare The BOSS 10S ONE-TWO BAGGER

Faster, More Uniform Work, Greater Profits

with any mixer selling for $250 more

The large size BOSS Drum fitted with the BOSS patented High Speed Remixing Action produces faster, better mix, speedier discharge and results in stronger and more uniform aggregate. 10 cu. ft. of concrete mixed per batch. Discharged in from 8 to 12 seconds. Many 60 to 80 hour non-stop pourings recorded. Think what these features mean when you want to push work harder. More jobs and bigger profits.

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Furnished with steel or rubber tired wheels

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Ample power is assured by best multicylinder gasoline engines on the market—either LeRoi, Hercules or Novo make.

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One-Two Bagger!

This machine handles one bag at 1-3-6 mix, or two bags at 1-2-5 mix. It answers the demand for a real 10 S One-Two Bagger and costs no more than some One Baggers. Extremely compact. Delivers 25 to 30 more batches daily. Built for long hauls. Furnished with 6 inch steel tires or disc wheels with rubber tires.

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Being a liquid integral compound, "ANTI-HYDRO" is easy to use. It mixes readily with the gauging water without the aid of skilled labor. For 23 years "ANTI-HYDRO" has been the accepted standard. Be sure to use it on your next job.

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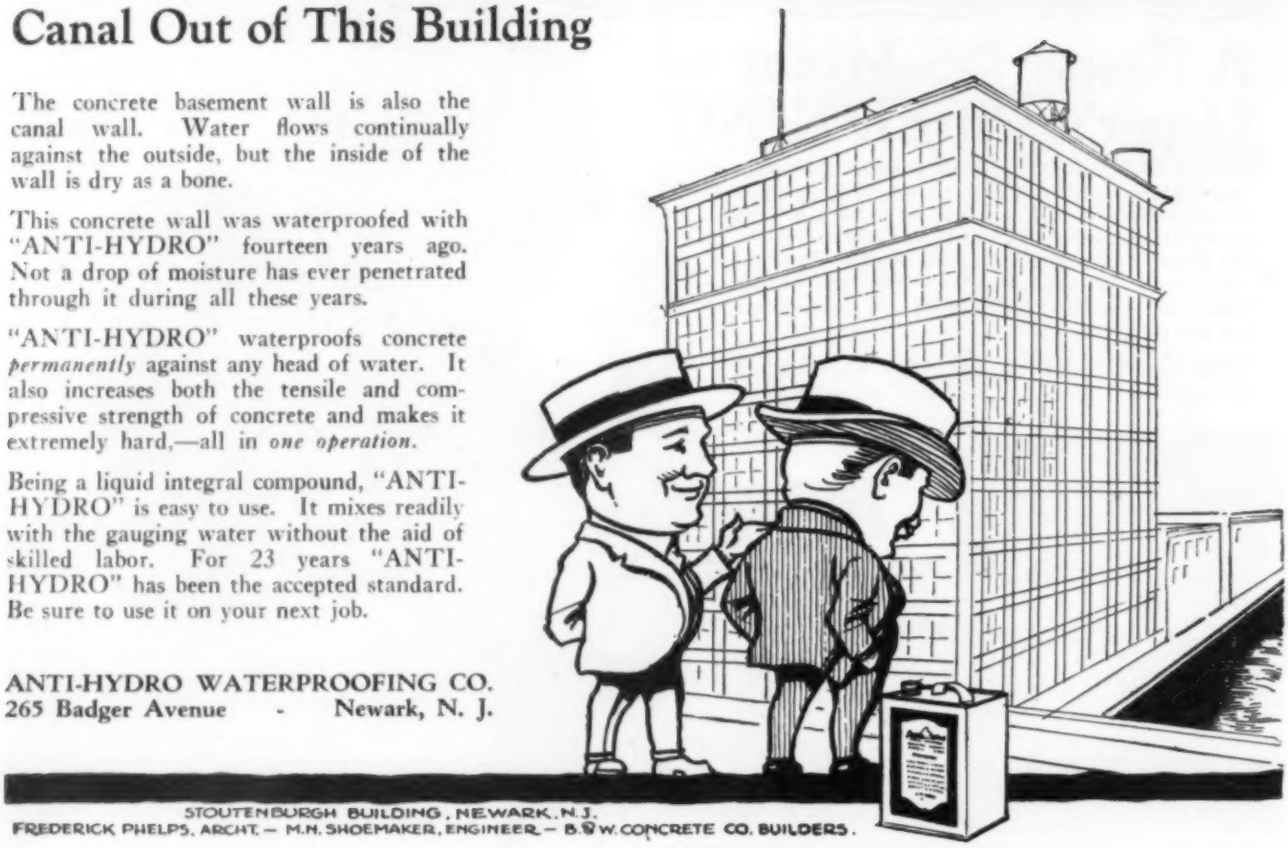

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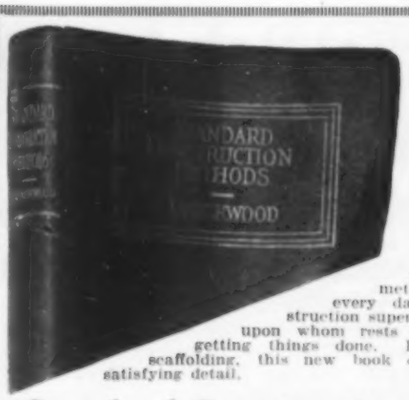

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K&E

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usually are found on jobs where *accuracy* and *speed* mean dollars to the contractor.

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ESTIMATOR for structural steel, ornamental iron and stairs for buildings; must have had experience as detailer in fabricators drafting room and be competent to make designs; state in application age, nationality, education, experience, salary required and date available; references will be required; location, New England. P-10, Construction Methods, Tenth Ave. at 36th St., New York, N. Y.

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construction, grading and paving concrete highways and streets. Twenty years' experience in various lines. Proficient organizer. Following if desired. Location, Middle Atlantic or Middle West. Available on two weeks notice.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of Construction Methods, published monthly at New York, N. Y., for Apr. 1, 1928.

State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared C. H. Thompson, who, having been duly sworn according to law, deposes and says that he is the Secretary of McGraw-Hill Publishing Company, Inc., publishers of Construction Methods and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

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Sworn to and subscribed before me this 30th day of March, 1928.

[Seal.] MARTIN J. WIEMER.

Notary Public, Queens County, Certificate No. 1819. Certificate filed in New York County, No. 272.

(My Commission expires March 30, 1928.)

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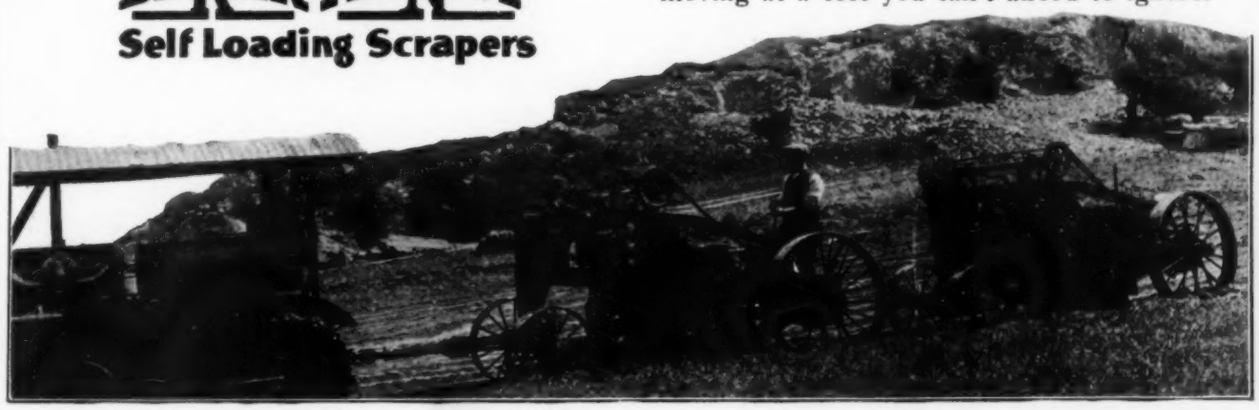

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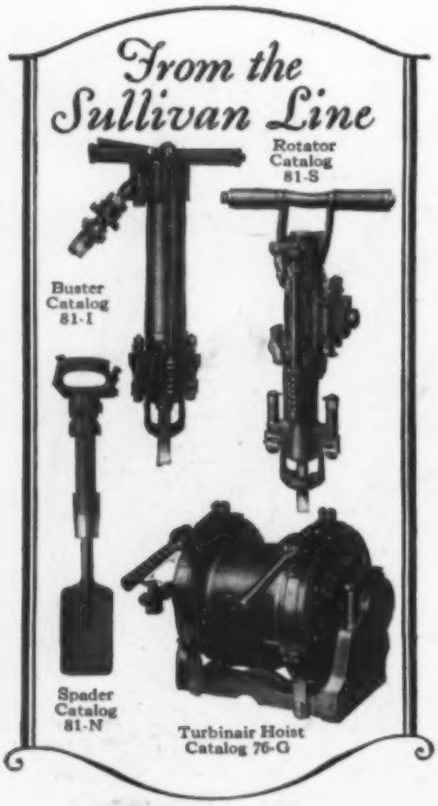

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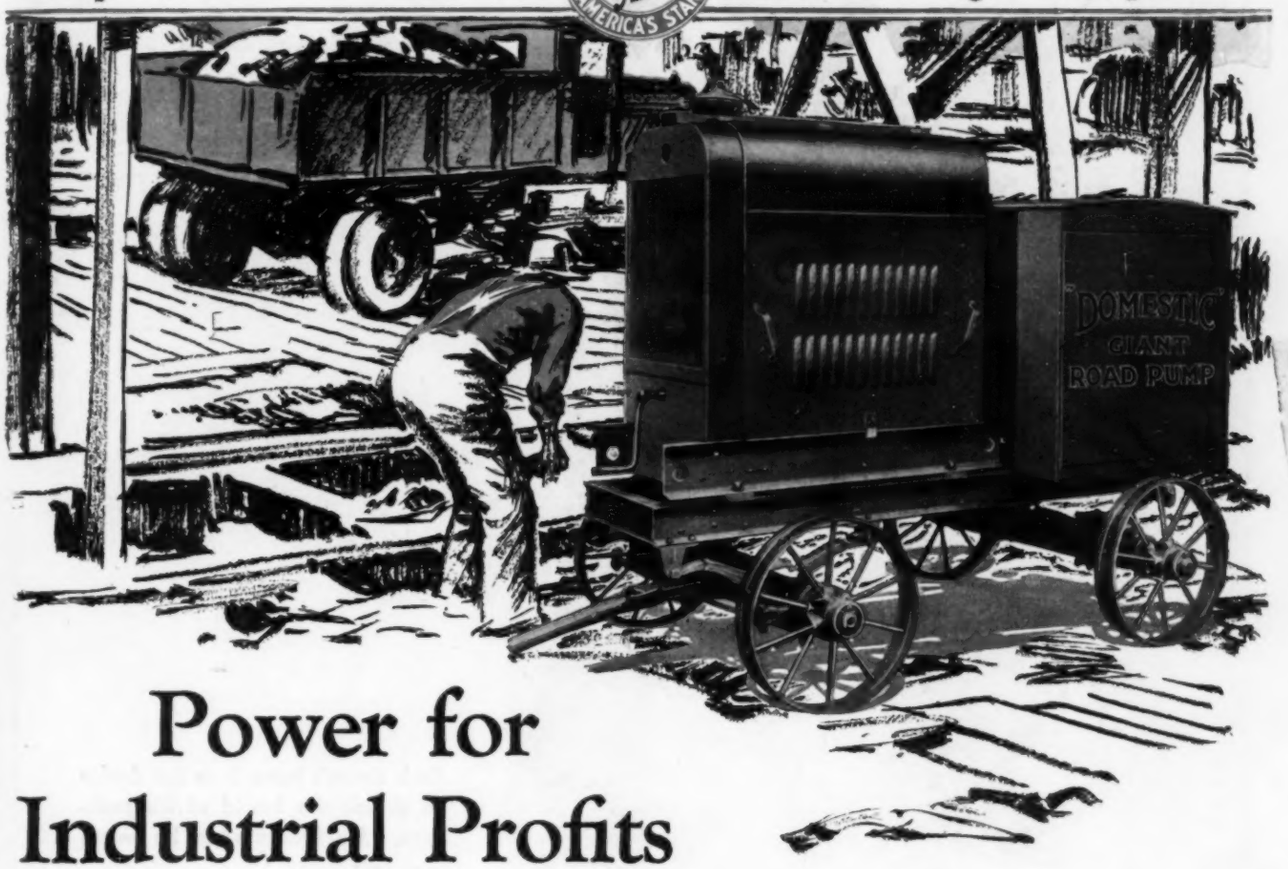

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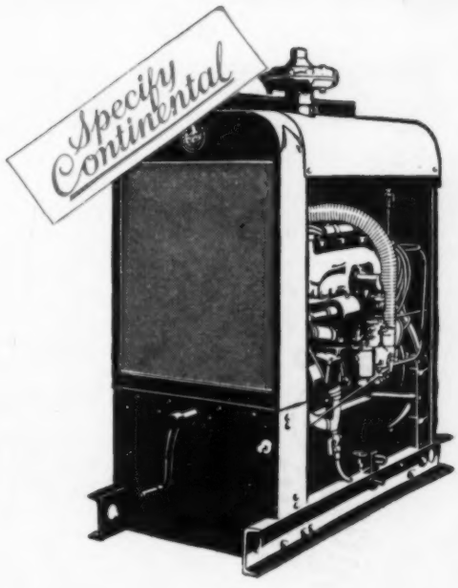

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